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ABSTRACT

Breakthroughs in science and social organization could soon be helping to save the lives of half the 40,000 young children who now die every day. They could also prevent several million children a year from becoming mentally or physically disabled. To achieve these goals, local successes showing that a child health revolution is possible must be translated into intensive national campaigns. The challenge is now primarily political rather than technical or financial. Primary health care makes such a revolution possible; education, communication, and social organization make it practicable. Growth monitoring, oral rehydration therapy, the promotion of breast-feeding, and expanded immunization are the four techniques making this revolution affordable even in the midst of economic recession. These techniques are low cost, presently available, and almost universally relevant; in addition, they achieve rapid results and empower those they serve. Three additional but more difficult and costly interventions that could reduce child deaths and child disabilities by two-thirds within 10 or 15 years involve (1) more food for at-risk women and children during pregnancy, breast-feeding, and weaning; (2) more choice for women regarding both the size of their families and the interval between births; and (3) more education to increase women's access to vital information. (Included are brief descriptions of successes and problems of health programs in 15 countries.) (RH)

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# THE STATE OF THE WORLD'S CHILDREN 1984

James P. Grant
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(UNICEF)

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- Essays—on the major themes of the report—by six leading experts in the field of child health.

- Twenty-five short accounts from around the world—documenting, in practice, the low-cost techniques which could now bring about a revolution in child survival and development.

- An extensive statistical section providing basic population and economic data on all nations plus special statistics on child nutrition, health and education. Fifty colour charts illustrate the central ideas of the report.

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# THE STATE OF THE WORLD'S CHILDREN 1984

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**Definitions**

The infant mortality rate (IMR) is the number of infants who die before reaching the age of one year—per thousand live births in a given year.

The child death rate (CDR) is the number of deaths of children aged 1–4 per 1000 children in the same age group in a given year.

# THE STATE OF THE WORLD'S CHILDREN 1984

James P. Grant

## A Revolution for Children

In the last twelve months, world-wide support has been gathering behind the idea of a revolution which could save the lives of up to seven million children each year, protect the health and growth of many millions more, and help to slow down world population growth.

Last year's *State of the World's Children* report outlined the recent advances in both biological science and social organisation which now make this revolution possible. Since then, the combined potential of these breakthroughs has been acknowledged by world political and religious leaders including the Presidents or Prime Ministers of Bolivia, Britain, Canada, Colombia, France, Haiti, India, Pakistan, the Philippines, Sri Lanka, Sweden, Tanzania, Thailand, and the United States.

Also in the last year, more evidence has been coming in from around the world to show that these drastic gains in child well-being can indeed be achieved at a relatively low cost and in a relatively short time – despite economic recession. The case studies in this year's report document actual examples of the techniques which make this revolution possible.

In brief summary, those techniques are:-

- Oral rehydration therapy (ORT) – a simple and inexpensive method of preventing or correcting the dehydration which is induced by diarrhoeal infections and which, with an estimated 5 million young victims a year, is the leading cause of child death in the modern world (see pages 18–22 ).

- Growth monitoring – the use of simple 10-cent child growth charts which, along with regular monthly weighing and back-up advice, can help parents to make better use of the food they have and prevent up to half of all the malnutrition in the developing world (see pages 13–15).

- Expanded immunization – using newly-improved vaccines to prevent the six main 'immunizable' diseases from killing an estimated five million children a year and disabling five million more (see pages 22–24).

- The promotion of scientific knowledge about the advantages of breastfeeding and about how and when an infant should be given supplementary foods (see pages 14–18).

In several developing countries, commitments have already been made to put these ideas* into action. In response to last year's *State of the World's Children* report the city authorities of Addis Ababa have publicly stated their intention of using these techniques to halve child deaths in the next four years. In Pakistan, the government has launched an Accelerated Health Programme which has already tripled the immunization rate and increased the distribution of oral rehydration salts from 1 million to 5 million packets a year. In Haiti, the response has been the launching of an intensive nation-wide programme with the proclaimed intention of reducing infant and child deaths by at least 25% in the next three years. In Colombia, President Betancur has responded to the report by saying that: '*This document informs on four recent scientific advances and offers the hope that, with a great effort by governments and communities, the outlook (for children) by the end of this century will be much better. All of these techniques will be applied here in Colombia*'.

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**If the three 'F's of food supplements, family spacing, and female education (see pages 26–32) could be added to these four techniques, then the number of children whose lives would be saved – and the number whose growth would be protected – would be even more dramatic. But in comparison with the four simple and inexpensive measures outlined above, family spacing is more difficult, food supplementation is more costly, and extending female education is both.*

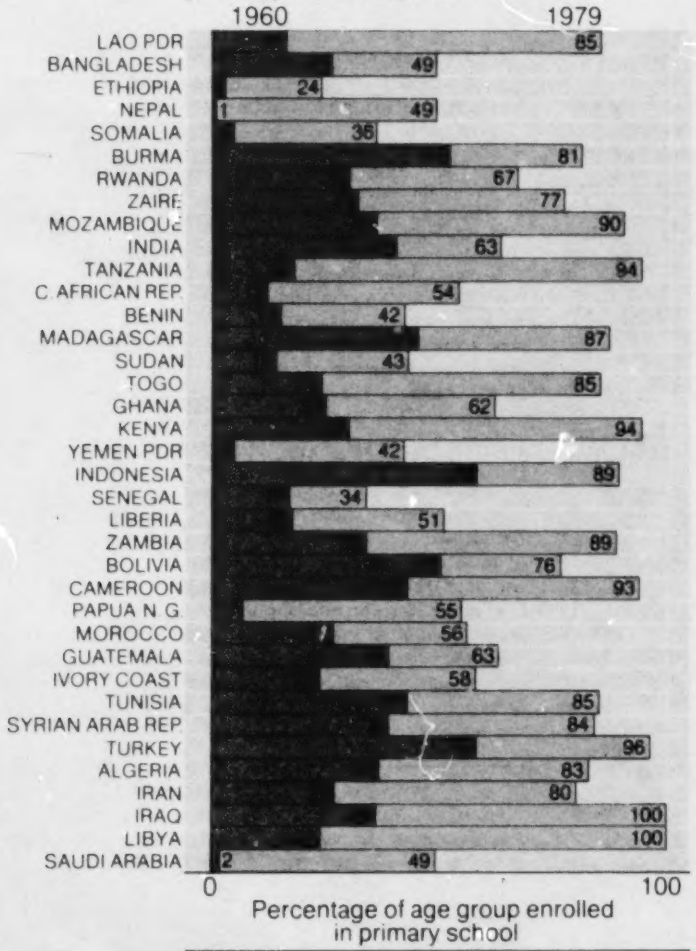
In New York, UN Secretary-General Javier Pérez de Cuéllar has said that: *'National efforts to mount such campaigns are now possible because the community networks and the means of communicating necessary for parents to learn about the forms and uses of simple therapies are increasingly available in many countries ... Innovative and cost-effective action along these lines would demonstrate that even in times of acute financial strain for social services and international co-operation, it is possible for the world to take imaginative steps to heal some of the most tragic wounds of under-development and poverty. I appeal to national leaders, to communicators, to health-care workers, and to concerned institutions and individuals to support this action.'*

In the industrialised world also, the potential significance of these breakthroughs has not gone unheeded.

In Washington, the U.S. Senate has adopted a resolution saying that: *'the techniques articulated by UNICEF in its report entitled "The State of the World's Children 1982–83" represent an unprecedented low-cost opportunity to significantly reduce child mortality and morbidity throughout the world, and have the full support and encouragement of the Congress at a time of economic difficulty and constriction for all countries.'*

In Rome, the Holy See has announced that *'the entire Catholic aid network in the various countries of the world, and especially in the developing nations, will lend its maximum support to these important simple proposals to improve the health of hundreds of millions of children'.*

**Fig. 1.1 Enrolment of girls in primary schools, 1960–1979**




Source: World Bank, World Development Report, 1982

The techniques which now make all of this possible have been pioneered in recent years by governments and health ministries; by doctors and paediatricians; by nurses and primary health care workers; by international agencies like UNDP, WHO, the World Bank, the International Red Cross and UNICEF itself; by voluntary agencies like the Save the Children Fund and Oxfam; by religious organisations of many faiths; by secular movements like the Bangladesh Rural Advancement Committee; and by institutions like the International Centre for Diarrhoeal Disease Research in Bangladesh or the Institute of Child Health in London.

Although constantly being refined, the breakthroughs in knowledge and technology already exist. But like all scientific or 'knowledge breakthroughs', an equivalent 'social breakthrough' is also necessary if they are to be taken off the shelf of potential and put at the disposal of peoples. And on this front also, the world has been changing.

Only twenty years ago, for example, the proportion of girls in the developing world who went to primary school and had the chance to become literate was less than 35%. Today it is over 80% (see Figure 1.1). Only twenty years ago, the radio was a rare novelty in the poorest half of the world. Today, there is at least one transistor for every two homes. Only twenty years ago, there were hardly any primary health care workers in the developing world. Today, there are over three million para-medics at work.

In short, these and other social advances of recent times are bringing the world to a position of great potential for progress. Slowly, the channels are being opened up between what science knows and what people need.

Coming together at this time, these breakthroughs in both science and social organisation could soon be helping to save the lives of half the 40,000 young children who now die every day.* They could also prevent several million children a year from becoming mentally or physically disabled. And UNICEF would not be worthy of its name if it did not now make the strongest possible appeal to the world that a children's revolution could and should begin.**

In all of this, the national and international media, so often criticised for conveying only the immediate at the expense of the important, have made an indispensable contribution. Several thousand articles and editorials in newspapers and magazines, plus extensive coverage on television and radio around the world, have carried the message of hope to hundreds of millions of people. Other than the 'hard news' of world events, the story of the potential revolution in child well-being has been one of the most widely reported and analysed international news stories of recent decades. The response of the public, world-wide, has revealed again the deep longing among ordinary people everywhere for a world

*Paradoxically, the reduction of infant and child deaths by half would lead to a fall in birth-rates and the stabilisation of world population at an earlier date and at a lower level. Pages 32 to 34 of this report discuss the relationship between infant deaths and infant births.

** In May of 1983, the representatives of the 41 nations on the Executive Board of UNICEF formally endorsed the measures set out in the 1982–3 'State of the World's Children' report.

in which children no longer suffer and die in numbers which are beyond the emotional embrace of the individual but which haunt the conscience of mankind.

In a relatively short space of time, therefore, the individual techniques which could bring about this revolution have been pioneered, their combined potential has been articulated, and the news of their availability has been warmly welcomed. But this is not enough.

# The Challenge

The fact that a major improvement in the health and well-being of the world's children *can* now happen does not automatically mean it *will* happen. And the challenge ahead is the challenge of translating the local successes which show that a child health revolution is a *possibility* into intensive national campaigns which will make that revolution into a *reality*.

That challenge is now primarily political rather than technical or financial. The evidence leaves no room for doubt that low-cost techniques are available to act as a springboard for this great leap forward for the world's children. Any government which now decides to make a serious commitment to saving the lives and protecting the health and growth of its children can now move towards that goal. And any government, institution, or individual in the industrialised world wishing to assist in that process also now has a clear opportunity to do so.

Money is important and more is needed. But a much greater need is the mobilisation of existing human resources and organisations behind this great cause. For a children's revolution cannot be accomplished through exclusively formal channels or by rigidly conventional means. In most nations, for example, official health services do not reach more than a quarter of the population. Bringing the benefits of recent breakthroughs to *all* children will therefore depend on the health professionals lending their expertise to much more far-reaching campaigns involving people, institutions, and channels of communication which go far beyond the present scope of the health services themselves.

That is why the UNICEF office in India, for example, is helping to organise national workshops on the 'children's revolution' for leaders of labour and industry, agriculture and education, the media and the voluntary organisations. '*Experience provides conclusive proof*,' says UNICEF's Regional Director in New Delhi, '*that we must mobilise all organised resources if impact is to be accelerated*'.

'Mobilising all organised resources' is the key to unlocking the present potential for drastic improvements in the health and well-being of children. For the great barrier to be overcome is the lack of awareness among parents, communities, opinion leaders – and even some health professionals – about the means now available for saving and nurturing life. Overcoming that lack of awareness will require the help and involvement of all the myriad social, political, and professional groups which can, on large scale and small, act as channels of support and communication to reach out and help parents to use present knowledge and new techniques to ensure the survival, growth, and development of their children.

'Organised resources' for promoting knowledge of

## Guatemala: halving deaths

In 1982, almost 400 'health promoters' in the eastern region of Guatemala began distributing oral rehydration salts as part of their routine work in the community. In total, the salts went out to a population of 64,000 people – a population in which the leading cause of child death was the dehydration induced by diarrhoea.

Ready-made sachets of salts were in short supply, but the problem was quickly and cheaply overcome. Using a simplified formula of sugar, salt and potassium chloride, packets of salts were made up at the local health centres. The initial cost of each local production plant was $550. Thereafter, one worker could produce around 300 packets per day at a cost of 1.5 cents each.

From the local centres, the health promoters made their rounds of the community to educate parents on when and how to use the salts. At the same time, posters were pasted up throughout the community warning of the dangers of diarrhoea. Almost all children suffer from diarrhoea some of the time. Most recover quickly, but in about 10% of cases dehydration suddenly sets in and then the child's life is seriously at risk.

Home visits by the health promoters taught parents that it was dehydration which killed their children and that early rehydration – at home – was the best cure. Each family was also given six small (250 ml) sachets of the locally made salts along with a sheet of clear, printed instructions. Because the health promoters were part of the community, they were almost always on hand to give advice and help at the moment when a mother actually had to start giving oral rehydration therapy to her child. After the first few times, most mothers became confident about using the salts and many became active promoters of the idea.

Before the campaign began, knowledge about oral rehydration therapy was almost zero. Packaged salts had been available at pharmacies. But there had been no promotion, so sales were low and costs were high. After the campaign, almost 90% of families with young children had packets of the salts available in their homes and over two thirds knew how and when to use them. The result was that actual use of the oral rehydration technique increased from less than 1% of diarrhoeal cases to more than 30%.

*Most important of all, the number of child deaths from diarrhoea fell by half in the year after the introduction of the salts.*

Even bearing in mind that yearly fluctuations in the child death rate are not uncommon in the area, the result is an impressive one. The total cost of expanding this campaign to the rest of the country (including the cost of the salts themselves) has been estimated at 4.7 cents per person or 0.2% of the country's health budget.

In the view of those involved in the campaign, the successful introduction of oral rehydration therapy would not have been possible without the spread of a primary health care network which had put a health promoter close to every family and involved people in action for their own health. To make a child health revolution possible, such 'social breakthroughs' are as essential as the technological breakthroughs themselves.

these techniques can therefore include the paediatricians and the doctors; the nurses and the paramedics; the agricultural extension services and the community development workers; the parliamentarians and the local officials; the teachers and the schools; the colleges and the universities; the medical schools and the research institutes; the churches and the clergy; the mosques and the imams; the trade unions and the employers' federations; the lawyers and the engineers; the commercial communities and the women's associations; the voluntary organisations and the aid agencies; the environmental groups and the family planning organisations; the Boy Scouts and the Girl Scouts; the traders and the shopkeepers; the youth movements and even the children themselves.

Whether or not people and their organisations become involved on this scale will decide whether or not the children's revolution will realise its potential. Oral rehydration therapy (ORT), for example, can in theory save the lives of most of those five million young children who now die each year from diarrhoea-induced dehydration. But if only 10% or 20% of children are in contact with modern health services, then many other channels will have to be used to put the ORT breakthrough at the disposal of the majority. And the fact is that ORT – which *The Lancet* describes as '*potentially the most important medical breakthrough this century*' – will not reach more than a small proportion of the children who need it unless it is also promoted through the primary schools and colleges; through the churches and the temples; through the women's nutrition classes and the work-place; through the water engineers and the extension workers; through the transistor radio and the press; through the television and the video-recorder; through the centres of culture and entertainment; and through every other channel which can reach out to help link present knowledge to people's needs.

This is the 'social breakthrough' which is every bit as important as the technical breakthrough itself if ORT – and the other main elements in the child health revolution – are to come anywhere near their dramatic potential for saving the lives and improving the health of millions of children throughout the world.

In almost all the places in the world where available 'solutions' are going into action on a scale commensurate with the problems, these social and communications breakthroughs are the visible, if varied, common factors:

In Nicaragua, 80,000 volunteers – farmers, students, workers – are taking the message of ORT to every region of the country. In Honduras, intensive year-round radio campaigns have taught almost all women how to make an oral rehydration mixture. In Brazil, over 300,000 volunteers – drawn from women's groups, church organisations, peasant co-operatives – have helped to reduce polio by 99% in the last three years. In Costa Rica, radio, television, and press campaigns have probably been more important than the health services themselves in promoting public education about health and hygiene. In Colombia, priests are introducing lessons about immunization and ORT at pre-marriage and pre-baptism counselling sessions. In Haiti, attempts are being made to have sachets of oral rehydration salts sold in every village store and every neighbourhood corner-shop. In Nepal, small drug store owners have got themselves trained to give basic advice to customers who have no other health services. In the Yemen Arab Republic, 200 self-help associations funded by an Islamic community tax or *zakat* are beginning to provide basic health care to villages. In parts of Oman, one child in each school is trained to prevent trachoma among fellow pupils. In the Philippines, the staffs of maternity hospitals are becoming involved in educating all new mothers about the advantages of breastfeeding and the dangers of the bottle. In Bangladesh, 900 workers for the Bangladesh Rural Advancement Committee are visiting literally millions of families to bring the news about ORT. In Indonesia, 7,000 family planning workers have been re-trained to help teach mothers in 15,000 villages about the use of child growth-monitoring charts. In country after country it is this involvement and commitment of organisations and individuals which now offers the potential for both creating and sustaining a revolution in the survival and well-being of the world's children

The challenge of the children's revolution is therefore a challenge for both governments and *people*. And for those who might doubt what ordinary people can achieve in the service of such a cause, it is worth recollecting that it is movements which have enlisted the commitment and caught the imagination of people which have brought about some of the greatest political and social changes of our times – the movement for political independence in the Third World; the movement for civil rights in the United States; the movements for the ending of unjust wars; for the protection of the environment; and for the rights of women.

In the past, such movements have been initiated and sustained primarily by those who were the victims of the wrong they sought to right. Children cannot start such a movement in their own defense. Yet in the last year alone the 15 million young children who have died in the developing world is the equivalent of the entire under-five population of the United States of America. On a European scale, it is as if the combined under-five populations of Britain, France, Italy, Spain, and the Federal Republic of Germany had been wiped out in a year. And for every child who has died, another has been left blind or deaf or crippled or retarded. Could any cause be counted more worthy of a people's movement?

## Recession

The 1980s may seem an unlikely time to be talking of a 'great leap forward' for children (see pages 37–38). An entrenched economic recession, and the lack of any present momentum towards a more just and workable world economy, mean that there is now very little realistic hope of any significant increase in the resources available for social progress during the remaining years of this decade.

Although pressure for accelerated growth and a more just and prosperous world must be sustained, the fact has to be faced that there will be very little social progress over the next decade if that progress is to depend mainly on increasing the financial resources available for it.

The central question for both industrialised and developing countries in the 1980s is therefore '*how can human progress be maintained in the absence of increased economic resources?*'

Faced with an analogous question during the oil crisis of the 1970s, the automobile industry responded by making cars lighter, engines more efficient, and styling more aerodynamic. In other words, progress was maintained by making better use of available resources. And for the maintenance of social progress in the 1980s,

there is no realistic alternative but to apply that same principle. For the rest of this decade, 'making more of what you have' will surely be the first principle of progress.

In the industrialised world, this principle may not prove to be too penurious. In health, for example, the restriction on resources comes at a time when progress has become less dependent on advances in health technology and more dependent on 'costless' changes in the way we live. America's prestigious Center for Disease Control in Atlanta has recently stated that the average 50-year-old American male, for example, could add 11 years to his life expectancy through four 'free' measures – not smoking, drinking alcohol only in moderation, avoiding obesity, and taking regular exercise. In other words, spectacular progress in health is still possible despite restrictions on resources.

In the developing world, on the other hand, there remain many fundamental needs which cannot be met without substantial economic progress. Two thirds of all the under-fives in the developing world, for example, still have no access to clean water.

Yet even in the poorer half of the world, doors are opening through which progress might still be made. And again, the way forward is lit by the principle of making more of what is available and finding ways to change the ratio between resources and results.

It is from this same principle that the present potential for improving the lives of the world's children now arises. Without new *ideas and strategies*, several million more children are going to die in the decade ahead than was thought possible even three short years ago, and many millions more are going to suffer mental and physical damage – unless a new way forward is found.

UNICEF believes that a new way forward for children in the 1980s is now available. Primary health care is the *idea* which makes this revolution possible. The spread of education, communication and social organisation is the *circumstance* which makes it practicable. Growth monitoring, oral rehydration therapy, the promotion of breastfeeding and expanded immunization, are the *techniques* which make it affordable even in the midst of recession.*

This report now turns to each of these three elements. Together, they add up to a possibility – not an inevitability: and the difference is the will and commitment of governments and peoples to bring about this revolution in the well-being of the world's children. For this alone is the switch which could now set the current of action running through this circuit of unprecedented opportunity. A children's revolution is possible – if the world wants it.

*As a convenient mnemonic, these 'cutting edge' techniques are often referred to as GOBI-FFF – standing for *G*rowth monitoring, *O*ral rehydration therapy, *B*reastfeeding, and *I*mmunization – plus the equally vital but more difficult and costly elements of *F*amily spacing, *F*ood supplements, and *F*emale education (see pages 26 to 32). There are, of course, other priority problems – especially malaria, intestinal parasites, iodine deficiencies and upper respiratory infections – and the precise mix of appropriate activities needs to be decided on in response to local problems and in consultation with local communities. The 'GOBI' elements are distinguished by being low in cost and universal in relevance.

## Papua N. Guinea: prescribing bottles

After independence in September 1975, the new government of Papua New Guinea became increasingly concerned about rising malnutrition and diarrhoeal diseases among the young children of the capital city, Port Moresby.

At the same time, surveys were reporting a steep fall in breastfeeding. In 1964, 94% of the mothers who left Port Moresby General Hospital were breastfeeding their babies. By 1974, the figure had fallen to 78%. Over approximately the same period, hospital admissions and deaths from gastro-enteritis had doubled.

A 1975 survey in the city found that 35% of babies were being artificially fed and that over two thirds of them were malnourished. Among breastfed babies, on the other hand, only a quarter were seriously underweight.

By 1976, the government was taking action to halt the decline of breastfeeding in Port Moresby and to prevent the bottle-feeding habit from spreading to the rural areas. All advertisements for artificial infant feeds were banned, and educational campaigns on the advantages of breastfeeding were mounted for health workers, schools and community organisations.

Towards the end of that same year, it was clear that the battle was being lost. Sales of artificial baby milk were hardly affected and the attempt to persuade shopkeepers and supermarket chains to voluntarily restrict sales of feeding-bottles had had little or no effect.

In July 1977, the government passed the Baby Feed Supplies (Control) Act into law. From now on, feeding-bottles and teats could only be bought from pharmacists and only on prescription from a qualified health worker. Before signing such a prescription, health workers were required to make sure that there was a good reason for changing to artificial baby-milk and that the baby's mother knew both how to mix up the formula in the right strength and how to keep the bottle and teat sterilised.

The penalty for supplying feeding-bottles illegally was steep: $300 for a first offence and $750 for second and subsequent offences. Almost overnight, feeding-bottles disappeared from the shelves of Port Moresby's shops.

In March of 1979, a follow-up survey found that the proportion of breastfed children had risen from 65% to 88% and that the proportion of seriously undernourished infants had fallen from 11% to 4% over the same period. Among children who were still being bottle-fed (almost all of whom had a prescription) the incidence of malnutrition had been halved.

By 1982, Port Moresby General Hospital was reporting a considerable drop in the number of young infants admitted for diarrhoeal disease. In the paediatric unit, only one child has died of diarrhoeal infection in the five years since legislation was introduced.

## Waiting for development

As a statement of the need for a children's revolution, and as a measure of its progress, the infant mortality rate (IMR) is perhaps the most crucial of all available statistics. Technically, the IMR is the number of deaths below the age of 1 year for every thousand live births. But because it is a statistic which has as much to say about the quality of children's lives as about the quantity of their deaths, it is also one of the most eloquent indicators of development itself. That is why the new statistical appendix, attached to this year's report, lists the countries of the world not in rising order of their gross national products but in descending order of their infant mortality rates.

The justification for this central place given to the IMR in UNICEF's thinking is not just that an improvement in the lives of children is as important as, and not necessarily a function of, economic growth. It is that – unlike GNP per head, which can be increased significantly by the disproportionate wealth of a minority – the IMR can be substantially reduced only by improvements in the life and health of the majority.

A revolution in child survival and development can therefore most easily be measured by falling death rates for infants and children. In the past, the conventional wisdom has been that further significant improvements in the lives of children – and consequent reductions in the IMR – depend primarily on accelerated economic development. UNICEF does not accept that view. Whilst recognising the important contribution of economic growth to the lives of children, we also believe that the means are at hand to make the protection of the mental and physical growth of children into a cause as well as a consequence of economic advance. For we believe that there is a profound connection between the growth of the mind and the body in childhood and the growth of economies and the progress of nations.

Nonetheless, it is an illuminating argument, for it exposes the historical roots of the present case for a child health revolution.

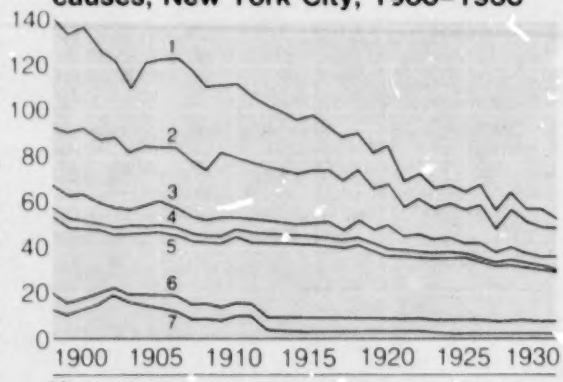
Less than a hundred years ago the infant mortality rate in Europe and North America was as high as it is in the developing world now. In New York City in the year 1900, for example, the IMR was approximately 140 per 1,000 – about the same as in Bangladesh today. In the city of Birmingham, England, a survey taken in 1906 revealed an IMR of almost 200 per 1,000 – higher than almost any country in the world in the 1980s.

A look behind these statistics also shows that the main causes of infant death in New York and Birmingham *then* were very much the same as in the developing world *now* – diarrhoeal diseases and malnutrition, respiratory infections, and whooping cough (see Figure 1.2).

Over the next fifty years, infant death rates in the industrialised world fell more steeply than anyone would have believed was possible (see Figure 1.3). In New York, the IMR dropped from 140 to around 30 by the middle of the century. And in the 40 years following that 1906 survey in Birmingham, the infant death rate fell from 200 to 46 per 1,000.

Throughout the industrialised world, the mainspring

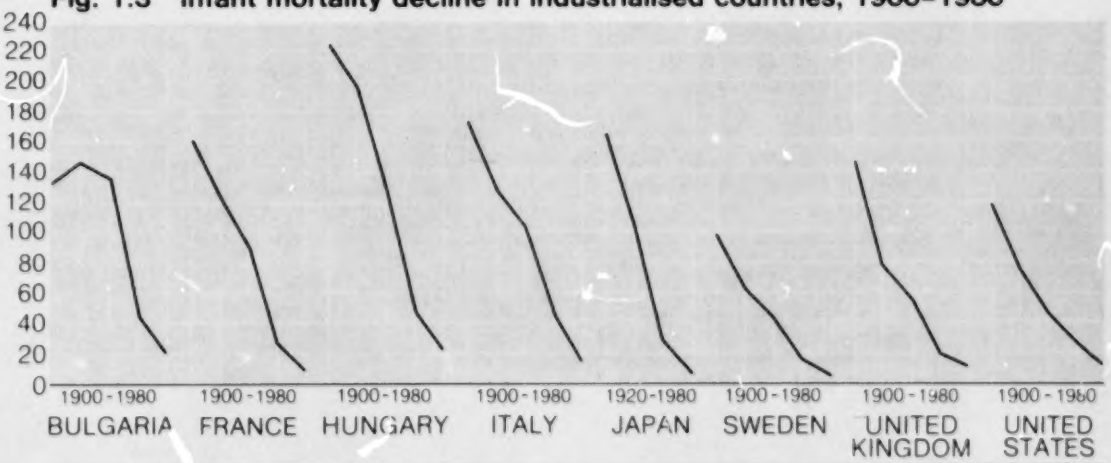
**Fig. 1.2 Infant mortality and its causes, New York City, 1900–1930**




Key
1 Digestive system (diarrhoea)
2 Respiratory infections, mostly pneumonias
3 Infectious diseases
4 Tuberculosis
5 Premature birth, injury at birth, other diseases peculiar to early infancy
6 Congenital malformations
7 All other causes

Source: New York City Department of Health, 1932

**Fig. 1.3 Infant mortality decline in industrialised countries, 1900–1980**




Sources: 1. U.N. Demographic Yearbook 1948, 1955, 1979 (supplement), and 1981.
2. B.R. Mitchell, European Historical Statistics, 1750-1970. Abridged edition. The MacMillan Press Ltd. 1978.
3. Michael Haines and Samuel Preston, New Estimates of Child Mortality in the U.S. in 1900. Wayne Economic Papers. No. 141. October 16, 1981.

of this great leap forward was rising living standards — better food, water, housing, sanitation, education and income. Although the spread of maternal and child health care was undoubtedly an important factor, health technology and medical services played only a secondary role. Effective vaccines against measles, for example, only became available *after* child deaths from measles had been reduced to almost zero by better nutrition.

Around the middle of the century, or just before, infant deaths began a similarly steep decline in Africa, Asia, and Latin America. From around 200 per 1,000 in 1950, for example, the IMR in the poorer half of the world fell to around 100 by 1975 – a drop of 50% in only a quarter of a century. To most observers, it seemed as though the developing world was following the path beaten by the industrialised world and it was confidently expected that infant deaths would continue to fall. As late as 1980, the General Assembly of the U.N. adopted the target of reducing infant deaths to 50 or less per 1,000 births in all nations by the year 2000.

Unless there is a sudden acceleration of progress, that target will not now be achieved. Latest indications are that more than 70 nations will still have infant death rates considerably higher than 50 per 1,000 by the end of this century (see Figure 1.4). And in those 70 nations, 3 out of every 5 of the world's children are born.

What has gone wrong? Why is progress in child health slowing down? And why have infant death rates not continued to fall steeply in the developing world as they did in the industrialised world?

The different pattern of declining infant deaths reveals the different balance of forces at work behind the scenes in the two different worlds. In the industrialised world, the dominant force was economic and social progress with medical services playing a supporting role. In most of the developing world, this pattern has been almost turned upside down. Newly-available interventions such as insecticides and antibiotics, transport and the control of mass famines, immunizations and epidemic control, have made the major impact; overall development and rising living standards took the supporting part. In India, for example, fully a quarter of the fall in child death rates was brought about by DDT-spraying campaigns against the malaria-carrying mosquito.

Sooner rather than later, progress based on such a pattern was bound to run up against its own inherent limitations. Modern medical services are too expensive for economically poor countries to provide to the majority of their people in such a short space of time; nor were such services designed to do battle with the great alliance of malnutrition and infection which was and is still the most important threat to life and health for the majority of families in the developing world today.

In consequence, the steep decline in infant deaths is now slowing down at a much earlier stage, and at a much higher level, than in the industrialised world. In the poorest countries, containing half of the world's people, average infant mortality rates are still reluctant to fall below 100 per 1,000 births* – as opposed to 20 or less per 1,000 in the industrialised nations today. And in the gap between an average IMR of 100 and an average IMR of 20, fall the bodies of approximately 40,000 children each day.

*In some African countries, the IMR is above 200 per 1,000.

# Brazil: defeating polio

In 1979, poliomyelitis killed or crippled 2,564 children in Brazil. It was an average year. Immunization against the disease had been slowly expanding for 20 years. But it was still only reaching a small proportion of the nation's children.

In 1980, the government decided that progress was too slow and that something special had to be done. With the personal backing of the President, and with the support of all government ministries, the Polio Control Operation was launched, adopting the optional approach of two doses of oral vaccine six weeks apart.

So the second Saturday of June and the third Saturday of August were declared national vaccination days. Saturdays were chosen so that parents would be free to bring their children for immunization. June and August were chosen because they are two of the coldest months of the year in Brazil and therefore the easiest months to keep vaccines cool.

The logistical problems of immunizing all the nation's children on one day could only be overcome by involving every kind of organisation – community groups, peasant co-operatives, youth groups, women's groups, neighbourhood associations, the churches, the schools, and the army, as well as the health services themselves. In readiness for the two days, 90,000 immunization posts were set up across an area larger than Western Europe or the continental United States. And because the oral vaccine can be simply dropped into the child's mouth, the campaign did not have to rely on highly qualified medical personnel. Instead, an army of 320,000 volunteers was recruited for the campaign.

In the days and weeks before the two national vaccination days, the media took the immunization message into almost every home in Brazil. On the nation's 123 television stations and 1,200 radio stations, 30-second immunization broadcasts were made 20 times a day. In the major cities, the print media gave space day after day for the campaign. In the villages, 3,900 loudspeaker services toured the streets broadcasting the same message and urging parents to turn up with their children on the appointed days. Such was the enthusiasm generated that when the call went out for volunteers for any particular task, it was not uncommon for three times as many people to turn up as were needed.

Existing vaccination records were very poor and it was almost impossible to decide which children had been vaccinated and which had not. The solution was simple and workable – vaccinate them all. So in the fall of 1980, 18 million children were given the two doses of vaccine against polio.

The national vaccination days were repeated in 1981, 1982 and 1983. In September 1983, the total of confirmed polio cases among Brazilian children was 10.

Over 50,000 children are killed and half a million are crippled by polio every year in the developing world. If Brazil's immunization coverage were to be achieved by all developing countries, then this annual toll on the lives and health of the young could be reduced by 99%.

From this brief account of falling infant death rates in industrialised and developing worlds, it might seem reasonable to argue that only overall development can now re-accelerate progress for children and lead to further significant falls in infant death rates.

If that were true, then the outlook for the world's children would indeed be bleak. As the half-way point in the 1980s approaches, the high road to economic development remains almost impassable, blocked by world recession, by debt crises, by declining terms of trade, by internal social disorder, by high unemployment, and by stagnating levels of aid. Meanwhile, progress towards a more just and workable international economic order remains becalmed.

To further darken this outlook, a glance down the too-long list of nations with high infant mortality rates despite their relatively high levels of GNP will demonstrate that there is nothing either rapid or automatic about the conversion of economic progress into tangible benefits for the poorest children and their families (see Figure 1.5).

So to accept the argument, and to wait for recession to step aside and allow economic development to resume its slow walk towards social improvement, is to accept that tens of thousands of children will continue to die each day and that millions more will live on in hunger and ill-health – a state of affairs which can and does undermine the very process of economic development itself.

What would these children say if they had a voice in world affairs? What would be their view about waiting for development?

These children do not die from exotic causes requiring sophisticated cures. Five million of them die in the stupor of dehydration caused by simple diarrhoea. More than three million die with the high fevers of pneumonia. Two million die marked by the rash of measles. A million and a half die racked by the spasms of whooping cough. Another million die with the convulsions of tetanus. And for every child who dies, many more live on in hunger and ill-health.

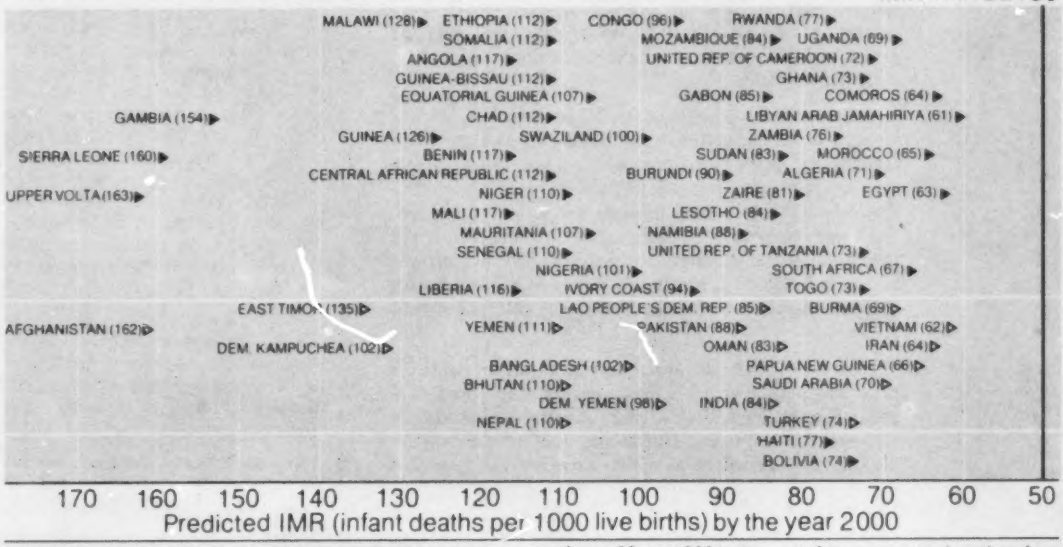
There has to be a better way forward, and there is.

## The new road.

In more recent years, a large body of evidence has accumulated to show that rapid progress in child health and well-being – including a further halving of infant mortality rates from around 100 to less than 50 per 1000 – can be achieved in low-income nations without waiting for GNP to lead the way. Pre-eminent among that evidence are the historically significant examples of the People's Republic of China, Sri Lanka, the two Koreas, Taiwan, and Kerala. In all of these cases, the infant death rate was brought down to around 50 per 1000 or less at levels of economic development which were lower than the average for the developing world today. And in all of these cases, this dramatic progress was achieved at a level of GNP lower than $400 per person. But all managed to reduce their infant mortality rates to levels far lower than the levels now prevailing in many middle-income countries where per capita GNP ranges from $1500 to $2300 a year. This ability to 'make more of what you've got' has not proven to be the prerogative of any one political or economic system. And nothing could show more clearly that drastic improvements in the health and well-being of a nation's children need not wait on, and do not depend on, economic growth alone.

Secondly, there is the recent evidence of direct attempts to improve child health and nutrition on a large scale and at a low cost in economically poor communities in many different parts of the developing world (see panel p 33). Summarising the evidence of ten such attempts in the developing world, a recent study came to the no less than stunning conclusion that '*taken together, they represent a persuasive case that, in the hands of able leaders and in populations of up to 60,000 to 70,000, well designed and effectively operated projects can*

**Fig. 1.4 Countries unlikely to reach IMR of 50 by 2000 AD.**




In 1980 the General Assembly of the United Nations adopted the target that infant mortality rates should be reduced to 50 per 1000 or less in all countries by the year 2000. On present trends, the 62 nations above will all have infant mortality rates of over 60 per 1000 by the end of the century and are therefore highly unlikely to achieve the target. The position of each country indicates its expected year 2000 infant mortality rate, based on present trends.

*Source: United Nations, Infant Mortality: World Estimates and Projections, 1950-2025*

*reduce infant and child mortality rates by one-third to one-half or more within one to five years, at a cost of less than the equivalent of 2% of per capita income – an amount no greater than that currently being allocated to health nationally'.**

Examples such as these, on large scale and small, were the grist brought to the mill of the first International Conference on Primary Health Care which met in the Soviet city of Alma Ata towards the close of 1978. There, a new relationship between health and economic development began to be worked out.

The negative premise of Alma Ata was that Western style health systems – on which so many developing countries had based their own health strategies in the immediate post-colonial period – were failing to meet the health needs of the majority and could no longer be looked to as the way forward. The positive impulse, on the other hand, was the realisation that new ways forward were now opening up – ways designed in, by and for the developing world, ways which held out the hope of a much greater improvement in health for much larger numbers of people.

The new ways forward were based not on highly specialised medical personnel working in expensive hospitals with sophisticated technology, but on active communities backed by appropriate technologies and well-trained paraprofessional development workers who were themselves supported by the full range of government services. Such community development workers, it had been shown, could advise on nutrition and water supply; help with hygiene and sanitation advice; organise immunization campaigns; distribute iron folate and vitamin A tablets; handle penicillin and other basic drugs; conduct anti-malarial and anti-parasitic campaigns; advise on family spacing and safer child-birth; deal with common local injuries and illnesses; and refer more specialised problems to more specialised people.

Surveying the hundreds of different versions of this theme brought to the Alma Ata Conference, it was possible to see that the developing world need not follow the same road to health as the industrialised world, that improvements in well-being need not wait upon the attainment of similar levels of economic development, and that the primary health care idea could now change the gearing ratio between health and wealth (see Figures 1.6 and 1.7).

In total, the governments of over 150 nations signed the Alma Ata Declaration on Primary Health Care (PHC). For some, it is so far only a paper commitment. For many, it marks the beginning of a new era in health. And it is that new era, as much as any breakthrough in knowledge or technology, which now makes a child health revolution possible.

In the last year, a major review of progress towards primary health care (conducted by the World Health Organization) has found that 49 out of 70 nations studied have drawn up specific plans for implementing the new approach and that many have already trained large numbers of paramedical staff. In India, for example, 200,000 *Health Guides* have been trained since 1977 and a further 380,000 are scheduled to be trained over the next three years. In Latin America, Colombia now has 5,000 *Promotoras* and an almost equal number have been trained in the Dominican Republic.

*Davidson R. Gwatkin, Janet R. Wilcox, and Joe D. Wray, *Can Health and Nutrition Interventions make a difference?* Monograph No. 13, Overseas Development Council, Feb. 1980.

# Egypt: an ORT failure

The 'Menoufia intervention' aimed to bring better health to the 1.4 million villagers of the Menoufia governorate in Egypt's Nile Delta. In particular, an attack was to be launched against the diarrhoeal diseases which were killing one child in every twenty.

By May of 1979, women with secondary school education had been recruited and trained in each of 105 villages. Over the next three months, these oral rehydration promoters visited 45,000 mothers to explain where to get and how to use the oral rehydration salts which, when mixed with the right amount of water, can prevent the deadly dehydration caused by diarrhoea.

The organisers of the campaign knew that they were not tackling the basic causes of infection. But plentiful water, safe sanitation, and home hygiene will take a long time. Meanwhile, 4,000 Menoufia children were dying every year from diarrhoea. And it had been shown in other parts of the developing world that oral rehydration therapy could save most of those children's lives. Privately, the organizers expected the Menoufia campaign to cut the child death rate by between a third and a half.

But it soon became clear that things were not going according to plan. And by the end of the first year, the death rate from diarrhoeal disease in the six 'treatment villages' remained at 55 per 1000 – the same as in villages untouched by the campaign. So what had gone wrong in Menoufia?

To find out, the organizers looked to the detailed information, gathered from mothers, on what exactly had happened in the last days and hours of life for each of the 171 children who had died of dehydration during the year.

Gradually, an explanation began to emerge. In the treatment villages hardly any of the mothers had actually tried to use the oral rehydration salts in their own homes. Ninety per cent of all the mothers whose children had died had sought professional medical help – some of them even making two or three visits to a clinic. Once there, most of the children had been given tablets or injections or even intravenous feeding before they had died. Only a third of the mothers had been advised to try oral rehydration and by that time it had been too late.

In short, the whole Menoufia intervention rested on an educational campaign which failed. Questioned afterwards, most mothers were so uncertain about when and how to use the salts that they either didn't use them at all or used 'too little, too late'.

One reason for the failure, the organisers suspected, was that the young village women who had been responsible for promoting oral rehydration therapy had 'lacked credibility'.

The post-mortem also turned up one other likely reason. Neither the communities themselves nor the local doctors had been involved in the campaign. The result was that there was neither moral support nor practical help to encourage mothers to use oral rehydration therapy when their children became ill.

In Menoufia itself, the lesson of year one has been learned.

The spread of such primary health care networks is an important thrust in the social and organisational breakthroughs which are the essential counterparts to the technological breakthroughs now available. But equally important are the opening up of communications channels, the spread of education, and the rise in the numbers of organised communities, action groups, and volunteer organisations throughout the developing world.

In Thailand, for example, almost 47,000 *Village Health Communicators*, all volunteers, are helping to spread new ideas about hygiene and health care. In Burma, there are now 16,000 unpaid *Community Health Workers* and their number is expected to double over the next four years. In Honduras, almost 1,000 *Health Representatives* are organising community action for health and 1,800 *Health Guards* are providing elementary care. In Niger, over 16,000 *Secouristes* are helping to provide health services to rural populations.

In addition to these growing armies of voluntary health workers, recent years have seen the increasing involvement of trade union movements, religious organisations, secular voluntary agencies, women's organisations, and youth movements – many of whom are now adopting development action as a common cause.

The sheer scale of all this activity is new. And combined with rapid increases in school enrolment, literacy, newspaper readership, transistor radios, roads and transport, it adds up to a new potential for mobilising human resources and putting low-cost techniques at the disposal of people's health.

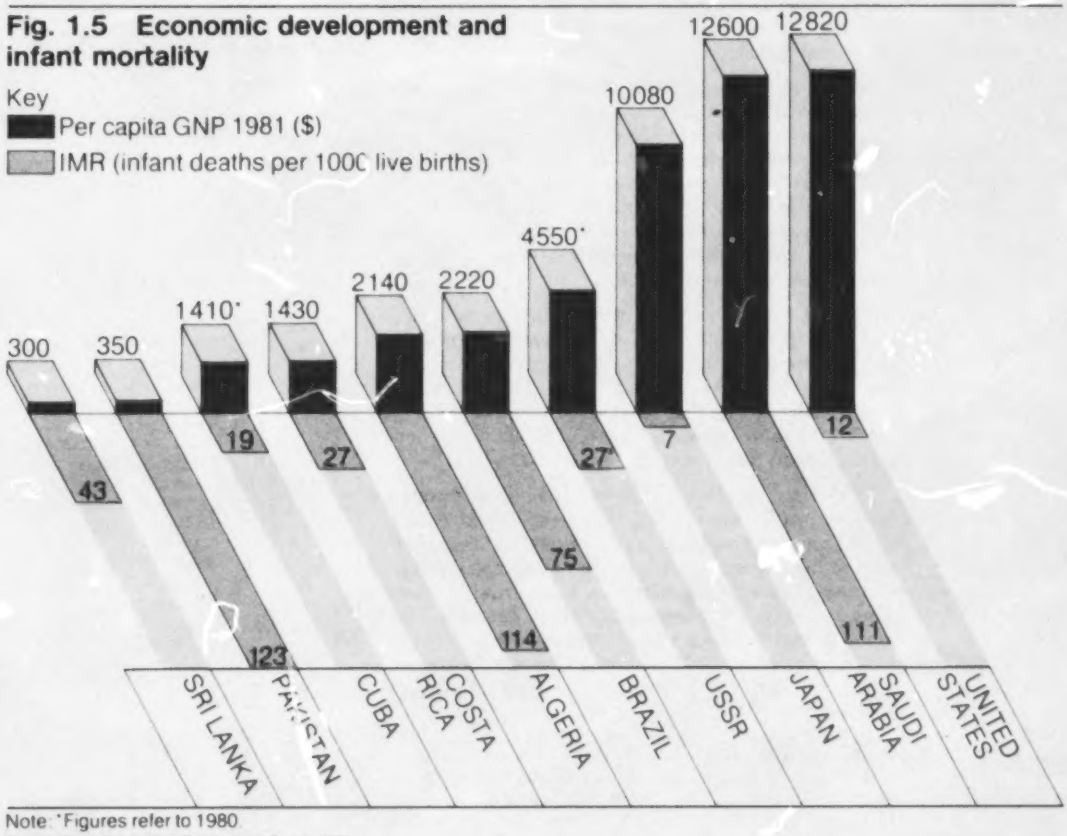
Within this new potential, the priorities for action are best decided on in consultation with the communities concerned. Goitre, malaria, trachoma, and river-blindness, for example, are devastating in some communities and almost unknown in others.

But for the children – the children of almost every poor village and neighbourhood anywhere in the developing world – life and health are threatened by a common enemy. That enemy is the alliance of infection and malnutrition which strikes at the growth of both mind and body.

That is why the four actions outlined at the beginning of this report – child growth monitoring, oral rehydration therapy, expanded programmes of immunization, and the promotion of breastfeeding and better weaning – occupy a special place within the idea of primary health care and the circumstance of organisational breakthroughs. For they are the PHC actions which – at low financial and political cost – could bring the most benefits to the most children in most parts of the developing world. And together, they could break the grip of that terrible alliance.

In any community – rich or poor – the best food for an infant is its mother's milk. In any community, the most important single check on a child's normal healthy growth is its regular gain in weight. In any community, the best treatment for a child at risk of dehydration is the early administration of oral rehydration therapy. In any community, the best protection against six of the most dangerous diseases of childhood is complete immunization during the first year of life. But in the developing countries, where so many individuals and organisations are now working to advance the cause of primary health care, these breakthroughs can be decisive:

**Fig. 1.5 Economic development and infant mortality**




Note: *Figures refer to 1980

Source: World Bank, World Development Report, 1982

- Because all four strategies empower parents to do the best they can for their children, they promote confidence and self-reliance.

- Because they are simple actions producing tangible results, they can generate enthusiasm for, and acceptance of, the wider cause of primary health care itself.

- Because they use appropriate technologies, they are available now and at low cost.

- Because they are involving rather than alienating, depending as much on community support as on professional expertise, they promote the very essence of the primary health care idea.

And because they address themselves to major causes of child illness and child death in almost all communities of the developing world, they have the potential to spearhead a revolution in the well-being of hundreds of millions of small children.

### The sinister alliance

The potential contribution of these four main elements towards that child health revolution cannot really be appreciated without an up-to-date understanding of the main cause of illness and death among the world's children. For although the causes of most of these 15 million child deaths a year – and of an equal number of disabilities – are shamefully simple and ordinary, they are clouded in misconceptions which obscure both the problem and its potential solutions.

Perhaps the greatest of those misconceptions is that malnutrition is caused only by the lack of food. Intestinal parasites can cause malnutrition. Changing from breastmilk to commercial substitutes can cause malnutrition. Not knowing how and when to begin weaning can cause malnutrition. And in half or more of all cases, malnutrition is caused by infection.

In practice, the relative weight of the two main causes – malnutrition and infection – is less important than the synergistic alliance between them. Children with even moderate malnutrition, for example, have been shown to be three times more likely to contract diarrhoeal infections and up to 10 times more likely to die from illnesses like measles. But the infection itself is equally likely to be the cause of the malnutrition. *All* infections have a nutritional impact. They can depress the appetite. They can decrease the body's absorption of nutrients. They can induce rejection of food by vomiting. They can drain away nutrients through diarrhoea. They can induce mothers to stop feeding whilst the diarrhoea lasts.* And by any or all of these methods, infections become a major cause – perhaps *the* major cause – of malnutrition among the world's children.

But the question is not whether the setbacks to the child's normal healthy growth are caused by inadequate food which lowers resistance to infection which causes further malnutrition – or whether infection induces malnutrition which in turn leads to more frequent infection. In practice, both malnutrition and infection are usually joined in a self-reinforcing cycle. And it is this cycle, by the very *frequency* of the attacks which it mounts on the vulnerable body of the growing child,

*In many parts of the world, the usual reaction of the mother when her child has diarrhoea is to stop giving the child food and drink. Although this seems natural, it can assist both dehydration and malnutrition.

## Egypt: ORT halves deaths

The Menoufia experience (see panel No. 4) painfully demonstrated an obvious truth: oral rehydration therapy can only reduce child deaths from diarrhoea if mothers are informed and confident about why, when and how the salts should be used.

It was a lesson well learned by the organisers of a second attempt to introduce oral rehydration into Egyptian villages. Leading the campaign was Dr. Sunny Salaam, of the University of Alexandria.

In 1980, two more villages in the Nile Delta – Berket Ghatas and Kafala – were chosen. Each had a population of around 4,000. Careful advance study threw up vital details – like the fact that the commonest kind of drinking glass used in the villages held about 200 ml. For easy measuring of the right mix, that meant that smaller packets of salts were needed. A brand called *Rehydran* was the one finally chosen.

In both villages, sachets of *Rehydran* were made available in the normal government health clinics and volunteers visited every family every two weeks to check on cases of diarrhoea and advise mothers on what to do about it. But in one of the villages – Berket Ghatas – the promotional campaign went way beyond the boundaries of the health service.

In Berket Ghatas, *Rehydran* was sold in every corner shop and small village store as well as at the health centres. And for a full year, the community was blitzed with information about how to stop diarrhoea from killing children. Meetings were held with community leaders and religious figures as well as doctors. Talks were given in the market-places, in the washing yards, in the schools, and at the festivals as well as at the clinics. Local entertainers were persuaded to include the *Rehydran* message in folk songs and plays. Cars toured the streets with public address systems blaring advice on oral rehydration. Everywhere, posters reinforced the message.

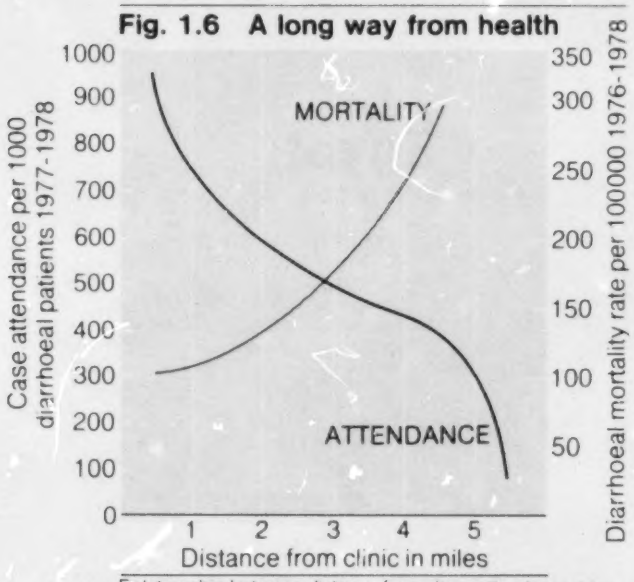
'In Berket Ghatas,' says Dr. Salaam, 'we went into the community because it is not just the mothers who decide what to do about diarrhoea, it is the fathers, grandparents, local healers, shop owners ... the whole community influences the way people think and act.'

By the end of the year, every mother in Berket Ghatas had heard about *Rehydran* and three quarters of them knew how to use it properly. When asked how diarrhoea should be treated, 87% of Berket Ghatas mothers replied 'Rehydran' – as opposed to only 12% in Kafala, where no special promotion campaign had been mounted.

*Most important of all, the number of child deaths in Berket Ghatas was more than halved by the oral rehydration campaign.*

The basic causes of diarrhoeal infection – inadequate water, sanitation and hygiene – have not been changed in Berket Ghatas. That campaign is still to come. But Dr. Sunny Salaam believes that something equally fundamental has been changed by their work. 'Before, people did not even think of diarrhoea as a disease, or that it was not natural for children to die from it... But now, we have turned mothers into doctors. They are treating their own children. This change is more important than you can imagine.'

**Fig. 1.6 A long way from health**




Relationship between distance from clinic, attendance rates, and deaths from diarrhoeal disease (Teknaf Diarrhoea Clinic, Bangladesh, 1977-1978)

*Source:* Rahman, M M. et al. *A Diarrhoea Clinic in Rural Bangladesh: Influence of Distance, Age, and Sex on Attendance and Diarrhoeal Mortality.* Am J. of Public Health vol. 72, No. 10, 1982

which kills so many millions each year and impairs the normal mental and physical growth of so many millions more.

In the poorest areas of the world, for example, children average 160 days of illness every year. Usually, this will include three or four episodes of diarrhoeal infection, four or five respiratory infections, and one or more of the common childhood illnesses like measles. All of these will cause weight loss which takes time to recover from – and therefore all of them are setbacks to normal healthy growth. Measles, for example, claims 10% of a child's body weight in one quarter of all cases. Similarly, several diarrhoeal infections a year can reduce a child's rate of growth by *half*.

Almost all children suffer some setbacks to that rapid curve of growth which sees a normal baby's birthweight doubled by about five months, tripled by one year and quadrupled by the age of two. But if those setbacks are frequent and severe, and if there is not enough time between them for the child to recover, then that smooth curve of growth begins to falter and break down.

With the rapid growth of brain and body which occurs in those early years of life, and with each stage of mental and physical development having its own time and place in that process, no child can afford too many such setbacks.*

In practice, the self-perpetuating cycle of malnutrition and infection means that one setback follows another with a frequency which disrupts normal growth during these vital early years. The consequence, for hundreds of millions of children, is that never in their lives will they fulfil their own potential. And the result of that, in turn, is to set up another self-perpetuating cycle of poverty whereby children who do not fulfil their potential for either mental or physical achievement are thereby condemned to remain in poverty and bring up their own children in circumstances where the cycle may well begin all over again.

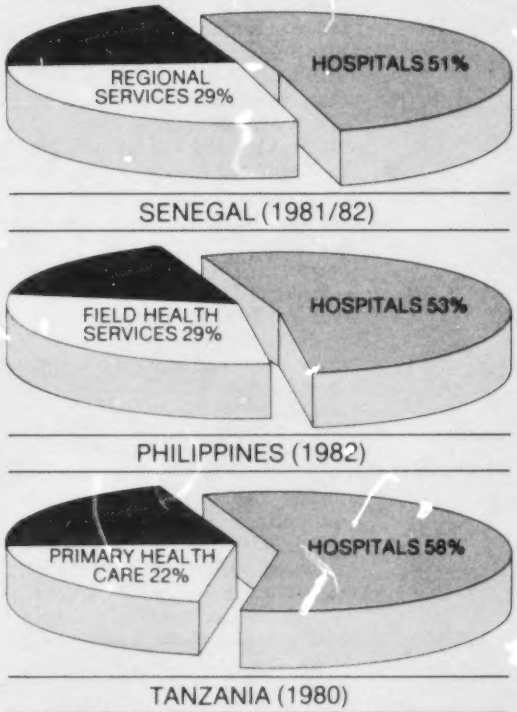
Nowhere have these inter-relationships been studied more intensively than in Narangwal, India, where the health of 35,000 people in 26 villages was studied by a team of 150 researchers over a four-year period. Its conclusion: '*It is now known that common infections precipitate malnutrition, which in turn reduces resistance. This facilitates further infections which again lead to increased nutritional deficit. If the sequence moves rapidly, the child dies – although neither malnutrition nor the infections by themselves would have caused death. When the sequence proceeds at a slower pace this combination is the major cause of chronic growth deficit, both physical and perhaps mental, in the more than 200 million deprived children in the world ... Nutritional deficits and associated lack of stimulation in early life interfere with both physical and mental growth. As a consequence, potential reduction through adult life in productivity and physical output represents a major limitation of human resources*'.*

These two inter-connecting and self-perpetuating cycles, the one linking malnutrition with infection and the other linking one generation's problems to the next, rank alongside economic injustice and inequality as major causes and perpetuators of poverty and underdevelopment. Indeed, they are closely allied to that inequality. For as the Director-General of the World Health Organization has eloquently expressed it: '*Mal-*

*Malnutrition and poor health have been shown to affect mental development both directly through physiological impact on brain growth and indirectly through lower energy and 'interest in life' at a stage when interaction with the environment, play and discovery, are important to a child's mental development.

*From *The Narangwal Experience* currently being prepared for publication by the World Bank.

**Fig. 1.7 Share of hospitals in health budgets**




*Source:* World Bank and WHO

*nutrition is both one of the causes of social injustice and one of the factors contributing to its maintenance. It reduces the capacity to learn during childhood and to earn during adulthood. The inevitable result is a downward spiral in which poor malnourished parents produce malnourished children who in turn will become poor and malnourished parents'.*

For the sake of the physical and mental development of children, and for the sake of the social and economic development of societies, that original cycle of malnutrition and infection must therefore be broken. Somehow, parents must be empowered, by all possible means, to reduce the frequency and severity of setbacks to the normal healthy growth of their children during those first few years of life.

It is in this context, the context of improved child well-being as a lever as well as a consequence of development, that the low-cost interventions now available could indeed be revolutionary. And it is to those opportunities that this report now turns.

# The Cutting Edge

### Growth monitoring

Regular monthly weight gain is the most important single indicator of a child's normal healthy growth. But neither a mother nor a paediatrician can gauge that monthly growth by eye.

Only about 1% of the world's children are visibly and obviously malnourished. But more than a quarter of the developing world's children suffer from *invisible* malnutrition. And its very invisibility is one of the main barriers to its prevention or cure.

A detailed review of several hundred nutrition programmes conducted by the Harvard Institute for International Development, for example, recently concluded that: '*The average moderately malnourished child in the 6–24 month age range looks entirely normal but is too small for his or her age, has lowered resistance to infection, and therefore easily succumbs to illness. The child receiving only 60% of caloric requirement may give no outward sign of hunger beyond a frequent desire to breastfeed. In the Philippines study, 58% of the mothers of second and third-degree malnourished children said they thought their babies were growing and developing well*'.*

At the same time studies in several countries, including India, Pakistan, and Indonesia, have also shown that more than half of all cases of malnutrition are to be found in households where there is no absolute shortage of food. The reason why available food is not given to a malnourished child is usually that the mother does not know that her child is becoming malnourished and does not know that a child has special nutritional needs. And in many cases, the child's own appetite is depressed – often by the same illness which is causing the malnutrition.

Making the problem of malnutrition visible to the mother – the one person who cares most and can do most to prevent it – could therefore be one of the

*Nutrition Intervention in Developing Countries, Harvard Institute for International Development, Oelgeschlager, Gunn & Hain, Cambridge, Mass., 1981.

## Indonesia: charting 2 million

Despite rapid economic growth over the last 15 years, Indonesia – the fifth most populous nation in the world – still has an infant mortality rate of around 100 per 1,000 live births. One of the underlying causes is that approximately a third to a half of Indonesia's children suffer from malnutrition.

In 1981, it was decided to see whether the very successful family planning organisation – an organisation including 7,000 trained field-workers and a network of village family planning posts staffed by thousands of volunteers – could also be used to help expand the government's family nutrition improvement programme.

By mid-1982, all 7,000 family planning workers had been retrained and were starting to launch the nutrition programme in 15,000 new villages throughout Java and Bali.

The surveys which had shown that up to 50% of children were malnourished had also thrown up one other crucial fact. There was often no difference in household income or economic status between families whose children were malnourished and families whose children were growing normally. Therefore it was decided that absolute shortage of food was not always the main problem.

The centrepiece of the campaign was a rainbow-coloured growth chart, specially designed after intensive market research, which was given to the mothers of 2.5 million children.

Instead of institutionalising the programme in clinics, the traditional village *arisan* or mothers' meeting is used as the weighing point. With the common market-place scale, called the *dacin*, all children under three are weighed each month and the results entered up by the mother – sometimes with help – on her own child's chart. The charts themselves, cost approximately 5 cents. On the reverse side of the chart, panels contain information on how to make up oral rehydration salts and nutritious weaning foods.

But the main message of the chart is that monthly weight gain is good, constant weight is a warning sign, and weight loss is a danger sign.

In each village, the mothers themselves have selected *kaders* or nutrition volunteers who have then been specially trained by the family planning field workers.

Because the growth chart is kept in the home by the mother rather than in the clinic by the health worker, the means and the responsibility for 'good nutrition' are not taken away from the mother herself. And because the chart makes the child's nutritional level visible and intelligible to the mother, it is a powerful educational and communication channel for teaching mothers the relationship between food, illness, weight gain and health.

Up to 2.5 million children are now being regularly weighed each month in Indonesia. When the programme is evaluated later this year, it is hoped that malnutrition will have been reduced by up to 50%. By the end of 1984, the plan is to extend the family nutrition improvement programme to 40,000 out of Indonesia's 65,000 villages.



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simplest but most important of all steps towards protecting and promoting the normal healthy growth of many millions of infants in those vulnerable early years.

For that task of making a child's nutritional status visible to the mother, an appropriate piece of technology already exists. Growth charts, costing less than 10 cents each, can show the mother whether or not her child is growing normally (see examples opposite). Regular monthly weighing and the entering up of the results on the chart reveal the vital information. And the accompanying message is simple: weight gain from one month to the next is good; weight constant is not good; weight loss is a serious danger signal.

Since they were first pioneered in West Africa by Dr. David Morley, growth-monitoring charts have been developed and refined in different regions of the world. Instead of being kept in the clinic by the health worker, many are now kept in the home by the mother. Instead of being printed on paper or card, some are now made of almost indestructible plastic. Instead of plotting the growth of each child against the curve of an average child, some charts now emphasise a normal *rate of growth* rather than a fixed idea of 'weight-for-age'. Instead of only recording weight and age, many charts also now show the dates on which a child should be immunized, record episodes of illness or clinic attendance, and carry advice about breastfeeding, weaning, family spacing and oral rehydration.

The main value of such charts is that they are practical and powerful educational tools for teaching mothers how to protect their child's healthy growth. With the chart, a mother can *see* progress or the lack of it, *see* the monthly weight gains or setbacks, *see* the downward falls from diarrhoeal infections and the upward jumps from extra feeding. The result of this visible symbol, this record and reminder, is the more informed involvement of the mother in the struggle for the health and growth of children:

- In Indonesia, 2.5 million infants and young children are being regularly weighed at the traditional monthly meeting of village women – and the results are being entered on growth charts kept by the mothers themselves.
- In Thailand, a programme based on the home use of growth charts by parents in several villages helped to completely eliminate third-degree malnutrition and reduce second degree malnutrition by 44% during 1981–82 – even though no additional food was provided.
- In Colombia, improvements in weight gain for a majority of children suffering from mild, moderate, and severe malnutrition have been achieved in poor communities by nutrition programmes incorporating the 'Carnet de Salud' or 'Health Card' kept at home by mothers.
- In Jamaica, a systematic programme to improve the health and growth of over 6,000 young children using growth charts, immunization, nutrition education, and milk supplements, has resulted in a 40% decline in the prevalence of malnutrition and a 60% fall in infant mortality.

In India, the Narangwal study cited earlier concluded that the *'worldwide experience with "road to health" cards for recording weight gain has been reinforced by experiences at Narangwal showing that it is possible to help mothers learn that a child with faltering growth is a sick child. Growth monitoring therefore served both as an educational device and as the principal entry point for active nutritional supplementation. It is our belief that the most important long-term impact from our nutrition programme was in the education of mothers. The nutrition problems in the Punjab result mainly from inappropriate feeding practices and the heavy load of infections. Our results showed that it is a fallacy to assume that if food supplies are sufficient in a village, people will solve their own nutrition problems. In most developing countries, just as important as improving food supplies is the need for a major effort to help mothers learn how to make better use of food. Much of the childhood malnutrition could be ameliorated by nutrients that are already available in the village'.*

However helpful they may be, there can be no pretence that growth charts will protect the growth of children in the homes of the unemployed and the landless where absolute shortage of food may well defeat any intervention which does not include food itself. But in the significant number of homes where food is available but where children are still malnourished, the more than 200 different kinds of growth chart now going into use in over 80 nations can be one of the most powerful of all 'technologies' for enabling parents to protect the healthy growth of their children.

## Breastfeeding

For infants who are breastfed, the first six months after birth are often the healthiest time in their lives. Even in very poor villages, or in the slums of the cities, young infants are often sleek-limbed and shining with health. Collections of growth charts from different nations confirm this evidence-of-the-eyes and usually depict smooth and satisfactory growth until half-way through the first year of life.

More than anything else, this healthy start reflects the protection which breastfeeding offers to all infants. And it is no exaggeration to say that if breastfeeding were to be gradually replaced by milk-powders and feeding bottles among the low-income families of the developing world, then the battle to protect the normal physical and mental growth of the majority of the world's children would be lost (see Figure 1.9).

In recent years, a surge of research has shown that, as well as being more nutritious and hygienic, breastmilk also 'immunizes' the child and helps to fight off infection. Milk powders, by contrast, can be over-diluted with unclean water in an unsterilised feeding bottle which is often left to stand in the tropical heat. The result is that babies who are bottle-fed are many times more likely both to be malnourished *and* to contract infections – so setting up the cycle of malnutrition and infection at an even earlier and more vulnerable age. Some of the evidence:

- In both India and Canada, separate studies have found that artificially fed infants were three times more likely to contract diarrhoeal infections and twice as likely to suffer from respiratory infections (the two main causes of child death) as infants who were breastfed.
- In Chile, artificially fed infants have been found to be two-to-three times more likely to die in the first year of life.
- In the Yemen Arab Republic bottle-fed infants have been found to be eight times more likely to be malnourished.
- In Central and South America, studies in several countries have concluded that infants breastfed for less than six months (or not at all)

were five-to-ten times more likely to die in the second six months of life than babies who were breastfed for six months or more.

◯ In the United States, a study in New York State has found that bottle-fed infants were hospitalised three times more frequently than breastfed infants during their first year of life.

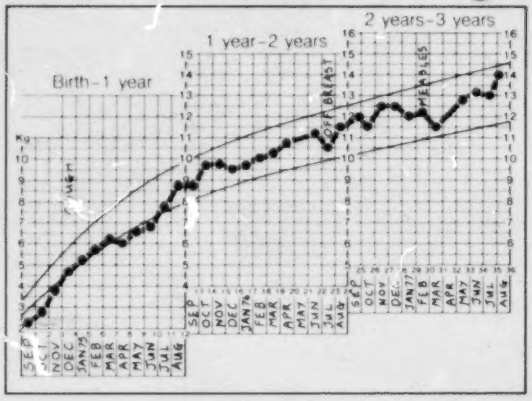
◯ In the Philippines, the decision to encourage breastfeeding instead of bottle-feeding of new-born babies at Baguio General Hospital reduced clinical infections by 88%, diarrhoeal infections by 93% and infant mortality by 95% (see panel p. 19).

◯ In Papua New Guinea, severe malnutrition among the children of Port Moresby fell from 11% to 4% after a promotional campaign and a ban on over-the-counter sales of feeding bottles had increased the incidence of breastfeeding from 65% to 88% (see panel p. 5).

◯ Surveying a total of 33 comparative studies of breast and bottle-feeding in different parts of the world, Dr. Anne Hill of the London School of Hygiene and Tropical Medicine has concluded that the risk of death in infancy was three times higher for 'mixed-fed' babies (both breast and bottle) and five times higher for babies who are exclusively bottle-fed.

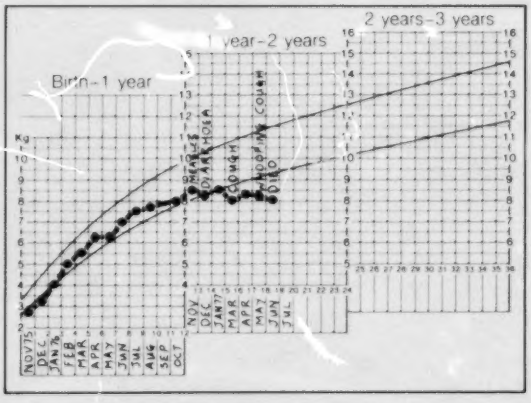
Despite this avalanche of evidence, there are alarming signs that breastfeeding is declining in many parts of the developing world.

# Growth Monitoring

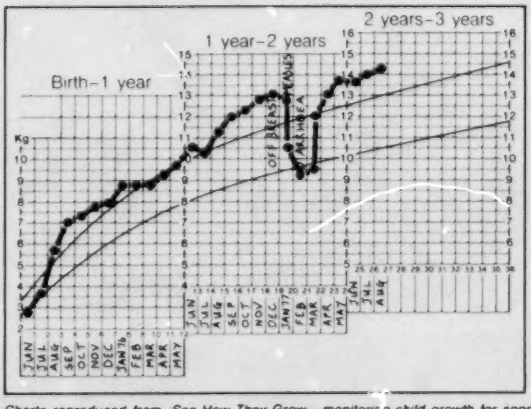



The charts shown here are reproduced from the actual growth charts of individual children. Around the edges of the charts —and on the reverse side—there are panels of advice on other aspects of child health—e.g. immunisation records and reminders, advice on when and how to use oral rehydration therapy and messages about breastfeeding and weaning.

The child who's growth is depicted on this chart made good progress, despite set-backs at the time of coming off the breast and after a bout of measles. Weight loss was not allowed to continue once it had been detected by the chart.



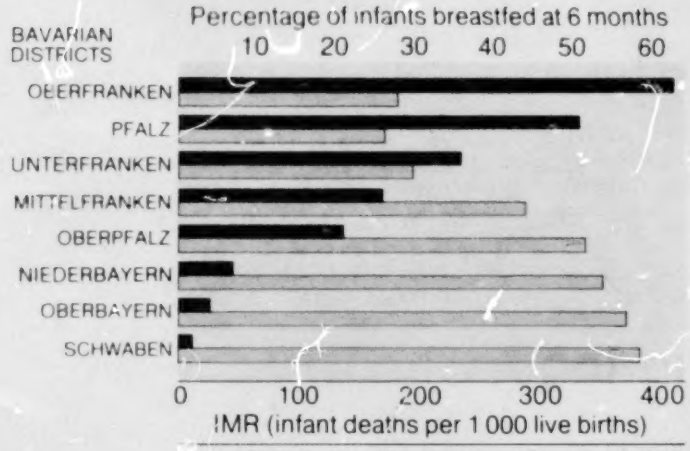

This child—a boy—also grew quite well for a year. But then measles, diarrhoea, bronchitis and whooping cough struck in quick succession. With no time for recovery inbetween each bout of illness and weight loss, the sheer frequency of the set-backs finally proved too much and the boy died half-way through his second year. The cause of death was recorded as 'whooping cough'. But as the chart shows, the real cause was the *combination* of infection and malnutrition, each reinforcing the other.




This child progressed well until coming off the breast at about 18 months of age. Soon afterwards, she developed measles and lost more than a quarter of her body weight. Part of the weight loss was caused by dehydration. Without a growth chart, this serious set-back might have gone un-noticed. As it was, extra feeding helped a satisfactory recovery and a rapid making-up of growth.
(original chart in Spanish)

*Charts reproduced from 'See How They Grow—monitoring child growth for appropriate health care in developing countries'—by David Morley and Margaret Woodland, Macmillan Tropical Community Health Manuals, 1979.*

**Fig. 1.8 Infant deaths and breastfeeding, Bavaria, 19th century**




Source: J.D. Wray, Feeding and Survival: Historical and Contemporary Studies of Infant Morbidity and Mortality. (Background paper prepared for WHO/UNICEF meeting on Infant and Child Feeding, 9-12 October 1978.)

In Brazil, the proportion of babies being breastfed at the age of one month has fallen from almost 100% in 1940 to less than 20% in the relatively affluent south and to less than 5% in the city of Recife in the needy north-east. (These figures pre-date the recent and massive campaign to promote breastfeeding in Brazil). In South Korea, prolonged breastfeeding has fallen from 55% of first babies to 35% in 10 years. In urban areas of the Philippines, the percentage of mothers breastfeeding fell from around 80% in 1957 to less than 10% in 1977.

Adding this evidence of the decline in breastfeeding to the evidence of its clear advantages, shows a drastic and unnecessary increase in both malnutrition and infection for millions of the world's young children. Campaigns to defend and promote breastfeeding, and to stop the spread of artificial substitutes, are therefore an indispensable underpinning of a child health revolution.

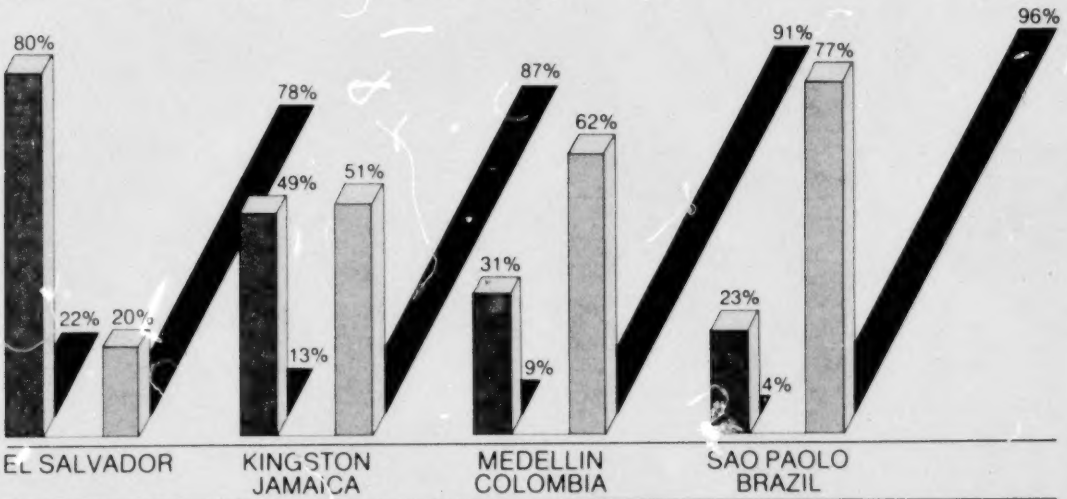
Such campaigns are now gathering momentum. Since the adoption by the 1981 World Health Assembly of the 'International Code of Marketing of Breast-milk Substitutes',* over 100 nations of the world – including countries like Brazil and the Philippines where breastfeeding has declined steeply – have started the process of changing hospital practices, adopting marketing codes, and protecting infants from the threat of commercial baby-milk promotion. In eleven nations, all advertising of breastmilk substitutes to the public has been banned and in some the distribution of free samples of infant food in maternity hospitals has also been prohibited.

At the moment, it is not clear whether this battle to reverse the trend towards bottle feeding is being won or lost. But if the trend is to be arrested, and if breastfeeding is to play its part in the child health revolution, then the campaign to promote its advantages will need to take root in the community as well as in the health services.

Present knowledge about the dangers of bottle-feeding should saturate every pore of the health services from paediatricians to paramedics, medical schools to maternity hospitals. But influential as these prestigious groups are, it is clear that the health services alone cannot give this campaign the outreach it now needs. Community groups, religious organisations, trade unions, the commercial community, women's associations, political parties, primary and secondary schools, the mass media, and other government services all have a part to play. In the Brazilian campaign, for example, the arguments in favour of breastfeeding have been put not

*The Code was drafted by WHO and UNICEF in consultation with concerned industrial, consumer, and professional bodies.

**Fig. 1.9 Breastfeeding and child survival**




Source: J.D. Wray, Feeding and Survival: Historical and Contemporary Studies of Infant Morbidity and Mortality. (Background paper prepared for WHO/UNICEF meeting on Infant and Child Feeding, 9-12 October 1978.)

just to all members of the health services but to all members of the public. In a 45-day information campaign all major newspapers, 100 TV stations, and 600 radio stations, took the message into almost every household in the country. Summaries of that same message also went out on bank statements, electricity bills, and even lottery tickets. At the same time, one and a half million pamphlets on breastfeeding were distributed to health centres and over 140 women's groups in six states launched educational campaigns. In the schools themselves, 15 states are now including information on breastfeeding in their regular curricula.

In the industrialised world, the recent and rapid return to breastfeeding – a movement which has usually been led by women in the higher-income and education groups – is to be welcomed both for the advantages it brings to children and for the influential example which it sets before the rest of the world. A little more than ten years ago, only about 30% of mothers in Northern Europe were breastfeeding their babies. In Sweden, Norway, and Finland today, the figure has risen to over 90% (see Figure 1.10). Similar reversals are being recorded in many other nations including Australia, New Zealand, Denmark, France, Japan, Spain and the United States.

The reason for the return to breastfeeding in the industrialised world is the scientific discovery of its many advantages, the rapid communication of that knowledge to almost every family, and the equally rapid acceptance of that knowledge by more educated and better-informed mothers. Now, that same knowledge must be made available in the developing world – and among low-income families in the industrialised world – where millions of mothers are using breastmilk substitutes which they do not need, cannot afford, and are unable to safely use.

Often without clean water, or refrigeration, or sterilising equipment, or fuel and time for boiling, or enough money for adequate quantities of powder, or enough education to read the instructions on the tin, the poor communities of the world cannot afford to make the same mistake as the industrialised nations.

There is one element of this growing campaign which poses fundamental difficulties but which cannot under any circumstances be ignored. To advocate breastfeeding is to advocate that mothers be available to suckle their infants every few hours of every day of every month for a year or more and to do this for several children over several years. To ignore that fact would be to turn the campaign to promote breastfeeding into another example of society applying the pressure of expectation on women without offering them even the semblance of support. Therefore that campaign must also concern itself with the issues of paid maternity leave; job security during pregnancy and childbirth; facilities for child care and breastfeeding at the workplace; provision of nursing breaks without loss of pay; technologies to lighten women's work-loads; community education about the processes of pregnancy, lactation and weaning; and changes in maternity hospital procedures.

Finally, the informed support of the community in general – and men in particular – could do much to improve maternal and child health by understanding and accepting the fact that pregnant and lactating women need to work less and eat more. Because it is the mother who does most of the work involved in bearing and caring for children, there is a tendency to talk about child health and growth as if it were the responsibility of the mother alone. But the truth is that

# Barbados: promotion fails

In 1969 a national food and nutrition survey carried out in Barbados revealed that very few mothers were breastfeeding their young babies. Anxious to reverse this trend, the country's health professionals took action. Bottles were banned from the maternity wards of Queen Elizabeth Hospital, where more than 90% of Barbadian children are born, and so were the 'milk nurses' who promote bottle-feeding. Mothers and mothers-to-be were given intensive education about breastfeeding in health centres and clinics and through the mass media.

Twelve years later Barbados carried out another survey. The sample included 126 mothers with babies less than a year old, who were questioned about their views on infant feeding.

At first glance the stepped-up educational campaign seemed to have worked. More than 90% of the mothers interviewed in 1981 had made the decision to breastfeed before the baby was born, and 70% said they had been well briefed in pre-natal clinics. Nearly 70% of them recognized the value of feeding during the initial colostrum period (as compared with only 30% of mothers in the 1969 survey).

But when the questioning shifted from what the mothers *knew* to what the mothers *did*, a different and more disturbing story began to emerge. Only 45% of them were still breastfeeding at three months, and at six months the figure was less than 20%.

Clearly, something had gone wrong: nine out of ten mothers had planned to breastfeed, but fewer than two in ten were breastfeeding six months later. Barbados' labour legislation allows three months' maternity leave on half-pay, which should enable working mothers to breastfeed at least for those three months.

Some clues to the paradox can be found in the mothers' situation at home. Nearly all of them were receiving child support from their baby's father, but only half of them were actually living with him. A breastfeeding mother needs to be readily available for her child, and this is not easily arranged when she has to run a household with insufficient assistance from a live-in husband or relative.

The difficulty worsens if she needs employment as well. Two out of five of the sample of Barbados mothers were employed, but not only did they have to return to work early (after only four to six weeks of leave), they also returned to work-places which did not encourage or even permit breastfeeding. Many of the remaining mothers, though not technically employed, were almost certainly doing some kind of work to eke out their income.

In the circumstances, it is no wonder that the mothers gave up. When they were questioned about it they said that they did not have enough milk (irregular feeding curtails the flow of breastmilk), and they said that they wanted their babies to get used to the bottle so they could easily be fed by others.

The children in Barbados lost out on the advantages of breastfeeding – not because their mothers lacked understanding, but because the support system that working mothers need was inadequate. Guaranteed, fully paid maternity leave, arrangements for home help, day-care centres or crèches near the work-place, nursing breaks at work – all these are also needed if working mothers are to be able to breastfeed their children.

few things could make such a significant improvement to the lives of women and children as men knowing more and doing more about the raising of their young.

### Oral rehydration therapy

As the half-way point in the first year of life approaches, one of two evils begins to undermine the normal growth and weight-gain of tens of millions of the world's infants. The first is that the mother will not begin to give her baby other food in addition to breast-milk. The second is that she will.

From the age of five or six months, breastmilk alone is no longer sufficient to meet the needs of a growing child. If supplementary feeding is not now introduced, then growth slows down, weight-gain falters, and resistance falls. Not beginning to add supplementary foods at this time therefore pushes the child towards the edge of the vortex of malnutrition and infection. Yet in many countries, including India and Bangladesh, more than a third of all infants are still being exclusively breastfed even at the age of one year or more. At that point, malnutrition is the certain result.

If, on the other hand, supplementary foods are introduced at the age of five or six months, then the risk of infection and malnutrition is almost as great. For as a child is weaned from the breast on to other food and drink, so it is weaned into increasing contact with an outside environment which may well include unsafe water, contaminated foodstuffs, unhygienic sanitation and uncontrolled infection. Weaned or unweaned therefore, it is at this point – mid-way through that first year – that so many millions of young children slip into the downward spiral.

To keep a child growing normally, there is no question that the introduction of supplementary foods must begin at this time. So help for the mother – help in weaning her child safely – is the next obvious fulcrum against which leverage for improvements in child health and growth can be exerted.

For most infants in most parts of the developing world, the greatest danger of the weaning period is the danger of dehydration induced by diarrhoeal infections. A study in the villages of Guatemala, for example, has shown that the incidence of diarrhoea increased sharply in the second six months of life and rose to become twice as likely in the second year as in the first.

To protect the child from diarrhoeal infection is a task which no mother can accomplish alone. For it involves an armoury of deterrents – health and nutrition education, more and better weaning mixes, more hygienic preparation and storage of food,* more water and safer sanitation, improved domestic and personal hygiene,** and immunizations against diarrhoea-inducing infections like measles.

Action on all of these fronts is obviously necessary – and not just for the prevention of diarrhoea. But in the meantime, dehydration continues to claim the lives – and strike at the growth – of millions of children in almost all communities of the developing world. Mothers therefore need help *now* if they are to protect the health and growth of their children through the vulnerable years. Thanks to one of the simplest but most important breakthroughs in the history of science, that help may now be at hand.

Diarrhoea itself is so common in the developing world – with an estimated 500 million children suffering the infection three or four times a year – that most parents regard it as just a normal part of growing up (see Figure 1.11). Normally, the infection cures itself in a matter of days, but in about 10% of all cases, something starts to go seriously wrong.

Perhaps feeding stops – the natural reaction of most mothers when a child has diarrhoea. Perhaps the child just won't eat – the appetite depressed by infection. Or perhaps the child's powers of recovery are already at a low ebb. Whatever the cause, the infection persists and the fluids continue to drain from the body. Soon, 5% of the child's body-weight is lost. Even now, most children will recover – though their growth will have received another serious setback. But for some, the diarrhoea continues.

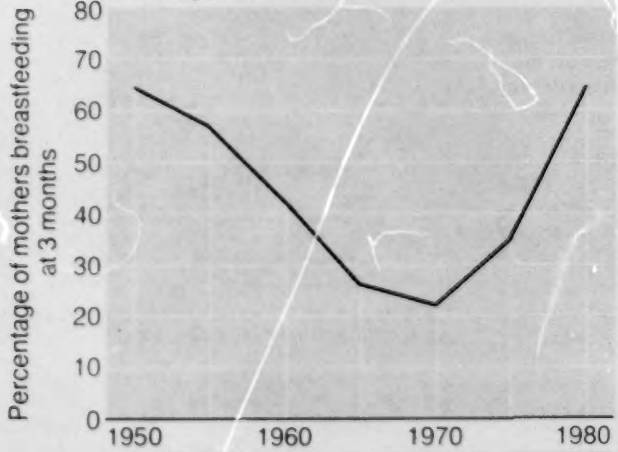
In a matter of hours now, the child's skin begins to lose its resilience and the thirst becomes unbearable, though the child may not have the energy to express it. Without urgent treatment, 10% of body-weight is soon lost. Now shock sets in, and stupor. Blood pressure begins to drop. The pulse quickens. Within minutes the kidneys begin to malfunction. Acids build up in the body. Peripheral blood cells begin to collapse.

*One out of every 20 children born into the developing world dies like this before reaching the age of five.*

Until recently, the only effective treatment recommended for dehydration was the intravenous feeding of solutions administered by qualified personnel in medical institutions which were beyond the physical or financial reach of most mothers. Now, the great majority of those 5 million dehydration deaths could be prevented by another breakthrough in the child health revolution – the use of oral rehydration therapy (ORT).

Attempts had often been made to rehydrate patients

**Fig. 1.10 Breastfeeding in Oslo, Norway, 1950–1980**




*Source: Elisabet Helsing, Infant Feeding in Norway. A Preliminary Overview. Report to the WHO Regional Committee 1981. Oslo, 1981, p.2*

*Recent research findings challenge the conventional wisdom by suggesting that contaminated food is more important than contaminated water in the transmission of diarrhoeal disease.

**Studies have shown that more frequent hand-washing with soap and water after using the latrine and before handling food reduces the incidence of diarrhoeal infection by between 20% and 50%.

by mouth – usually by making them drink solutions of salt and water. But diarrhoeal infections not only increase the loss of fluids and salts from the body, they also inhibit the absorption of salts and water through the intestinal wall. Nonetheless it was the addition of sugar to such a salt and water solution, in an attempt to make it more drinkable, which led to the accidental discovery of oral rehydration therapy. For it was shown that the absorption of sucrose was not affected by the infection. And the sucrose carries salt and water through with it.

So by using glucose as a Trojan Horse to smuggle salt and water through the intestinal wall, oral rehydration was suddenly made possible. Mixed in the right proportions, the sugar can increase the body's absorption of the salt and water by twenty-five times. And by administering enough of the solution to replace fluids lost to the body during diarrhoea, dehydration can be prevented or corrected in almost all cases. In the remote Teknaf region of Bangladesh, for example, a three-year study of over 30,000 cases of diarrhoeal infection has shown that 95% could be successfully treated by ORT.

Oral rehydration salts can be made up locally in health centres (see panel p. 3). Or with the right kind of community education programme, an almost equally effective mix can be made by mothers using ordinary domestic sugar and salt – supplying potassium in the form of bananas, plantains or papaya. Alternatively, the right proportions of salt and sugar, with small quantities of potassium and bicarbonate (to correct metabolic acidosis), can be made up and pre-packed in factories at a cost of less than 10 cents.

Whatever kind of oral rehydration method is used, the two vital messages for parents are:

- Continue feeding even when your child has diarrhoea and ...
- Begin replacing fluid losses by oral rehydration treatment as soon as the diarrhoea begins.

By this technology and these messages, most dehydration deaths can be prevented and growth can be maintained. Studies in the Philippines, for example, have shown that children treated with oral rehydration therapy during attacks of diarrhoea maintained monthly weight gain whereas children who did not have ORT available had lost weight as a result of diarrhoeal infections.

So much for the theory. Does ORT work in practice?

- In Guatemala, child deaths have been reduced by half among a population of 64,000 people in the eastern region of the country after 'health promoters' began teaching mothers how to use locally-made packets of oral rehydration salts (see panel p. 3).
- In Egypt, child deaths in the Nile village of Berket Ghatas have been reduced by 50% within a year of a community-backed oral rehydration campaign (see panel p. 11).
- In India, a population of 18,000 people in thirteen villages of the Punjab has seen its infant mortality rates from diarrhoeal infections *halved* by ORT in less than two years.
- In Costa Rica, child deaths from dehydration have dropped by more than 80% in hospitals since ORT was introduced and the hospital services have saved an estimated $3 million in the first year.
- In Egypt, thousands of mothers have reduced

## The Philippines: deaths down 95%

Over the years, artificial feeding of babies had become accepted practice at Baguio General Hospital in the Philippines. New-borns were separated from their mothers at birth and fed with powdered milk in nurseries decorated with posters and calendars promoting various brands of infant formula. From time to time, representatives of the milk-powder companies came in to give a sales talk to the staff of the maternity wing and to restock the cupboards with free samples of milk powder for new mothers.

In April 1975, all that changed. Natividad Relucio-Clavano, Chief of Paediatrics at Baguio, returned to the Philippines after working for some time with Professor David Morley at London's Institute of Child Health. There she had become convinced that the decline of breastfeeding was one of the most serious threats to the health and lives of infants in the developing world.

'My training with Dr. Morley was a turning-point in my life,' says Dr. Clavano. 'I came back to the Philippines determined to start my own personal campaign for breastfeeding in Baguio City and the rest of the country.

'I closed the door to the milk companies. We stopped giving our babies the starter dose of infant formula. Down came the colourful posters: in their place we hung the "baby killer" posters which show an emaciated baby inside a dirty feeding-bottle.'

Instead of being separated in a nursery, new-born babies were 'roomed in' – given to their mothers almost straight away so that breastfeeding could begin immediately.

Through all this, the hospital staff itself had to be convinced. Strongly supported by the Chief of Obstetrics, Dr. Clavano began a campaign of educating doctors, nurses and medical students, stressing that breastmilk is more nutritious, more hygienic, contains immunological and anti-infective agents, and is cheaper for both mothers and health services. Without the money and space and staff time required for bottles, teats, mixing the powder and sterilising, the maternity wing could run more efficiently and give more attention to the mothers and babies.

As soon as the new procedures for rooming in and breastfeeding were instituted in the hospital, there was a noticeable drop in infant illness. But when a formal study was made to evaluate the effects of the change, the results were nothing less than startling.

Comparing 4,720 babies born during the two years before the change was made with 5,166 babies born during the two years after the change, it was found that the incidence of clinical infection had fallen by 88%; the incidence of diarrhoeal infection had fallen by 93%; and the incidence of infant deaths had fallen by 95%.

Over the whole four-year period, 67 babies died in the hospital. All but two had been bottle-fed. 38 of the babies who died were victims of diarrhoea: all had been bottle-fed.

Dr. Clavano is now working to make the eloquent message of Baguio heard across the Philippines.

the overall pre-school death rate from diarrhoeal diseases by 50% – using home-made salt and sugar solutions.

◯ In Bangladesh, community-based distribution of oral rehydration salts in the village of Shamlapur (population 7,000) resulted in 80% of diarrhoea cases being treated with ORT and a fall in the death rate to 0.5% of all cases as opposed to 2.4% in comparable villages.

◯ In India, death rates from diarrhoea in six villages fell to levels 80% lower than in nearby villages after health workers and community organisations began promoting locally-manufactured oral rehydration salts.

◯ In Honduras, the number of diarrhoea deaths among children under the age of two has been almost halved by the use of ORT. One year after the beginning of an education campaign – backed by intensive radio coverage – 95% of mothers knew how to make and administer the salts (see panel No. ).

◯ In Trinidad and Tobago, child deaths from diarrhoeal infection dropped by 60% in the General Hospital, Port of Spain, in the five years after ORT replaced intravenous feeding as the main treatment for dehydration.

◯ In Haiti, the diarrhoea death rate among children brought into the State University Hospital, Port-au-Prince, fell from 40% to 1% after ORT was introduced in 1980. Because the mothers themselves were taught ORT, each child benefited from 'intensive care' and earlier rehydration.

◯ In Bangladesh, 900 field-workers have taught 2.5 million women how to make ORT solutions from the salt and molasses available in every household. Follow-up surveys have shown that more than 90% of the mothers can prepare an effective mix and a significant number are now using it (see panel p. 29).

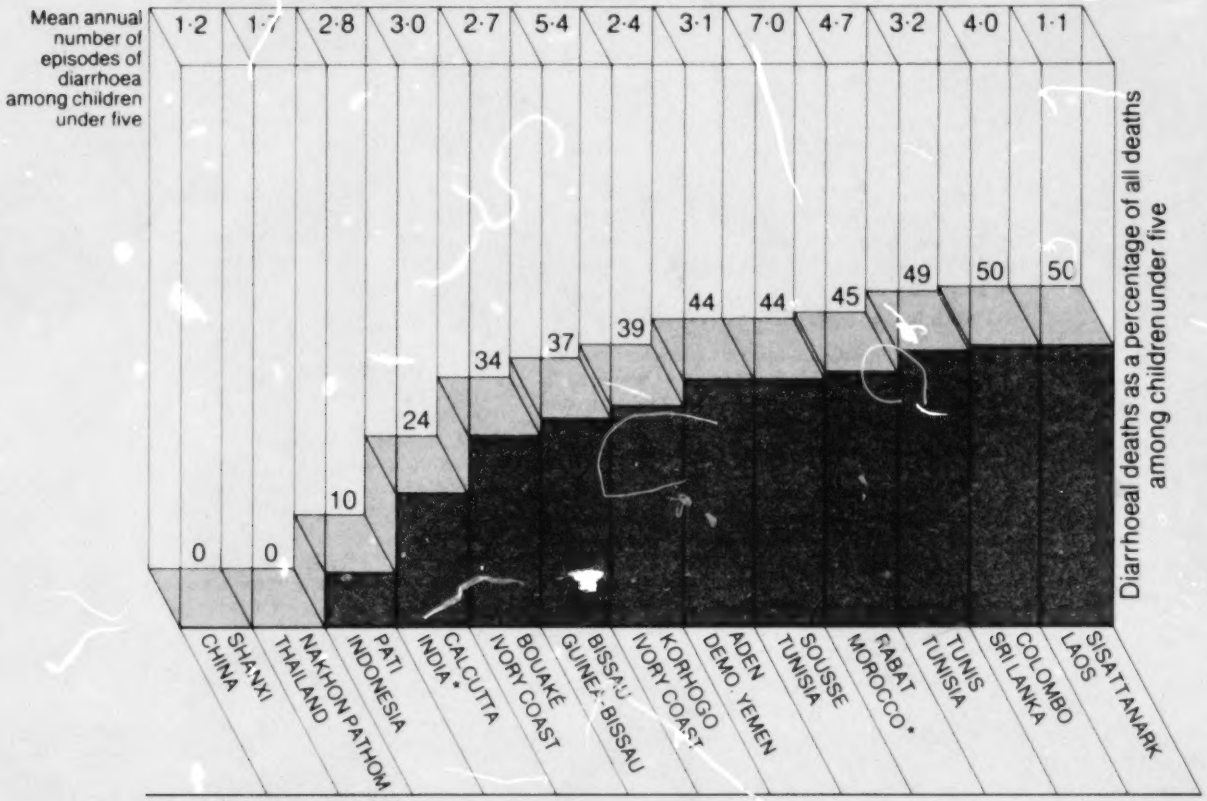
◯ In Nicaragua, 80,000 young literacy workers have carried the ORT message into thousands of households and 334 ORT units have been set up across the nation. From being the leading cause of child death in 1980, diarrhoeal infection had dropped to fifth place by 1982 (see panel p. 21).

◯ In Jordan, 1,720 out of 1,732 cases of diarrhoea were successfully treated by ORT in the General Hospital of Amman.

◯ In one area of Turkey, the number of cases of diarrhoeal infection which had to be referred to fully qualified doctors has fallen from 34% to 4% since Assistant Nurse Midwives began taking oral rehydration salts into village homes and teaching their use.

Such examples demonstrate the potential of ORT. Both in preventing infant deaths and in preventing frequent setbacks to normal healthy growth, the technique could play a major part in a child health revolution. And there are now signs that things are starting to move. Countries as diverse as Nicaragua, Haiti and Honduras have now launched ORT campaigns designed to put this breakthrough at the disposal of every family. In total, over 30 nations are now beginning ORT programmes and at least 20 are

**Fig. 1.11 Child deaths from diarrhoeal infections**




Note: *1981 figures, rest 1982.

Source: Programme for Diarrhoea Control. Third Programme Report, 1981-1982 WHO/CDD/83.8 Geneva

gearing up for large-scale factory production of oral rehydration salts (see Figure 1.12). UNICEF itself is producing over 20 million sachets a year for 87 nations and, together with the World Health Organization, we are assisting more than 20 countries to begin local manufacture. Brazil alone is preparing to produce 20 million sachets a year and Pakistan has stepped up its distribution of salts from one million sachets in 1982 to five million in 1983. In total, present annual production of oral rehydration salts is running at around 80 million sachets a year as against the billion or more which would be needed if the sachets were to be made available to all children at risk.

But shortage of the salts themselves need not prevent the rapid spread of ORT. For if parents have the knowledge and the confidence to mix sugar and salt and water in the right proportions, then an almost equally effective oral rehydration solution can be administered in the child's own home. Although not quite as good as the pre-packaged salts made according to the UNICEF and WHO recommended formula, this slight disadvantage is more than made up for if home preparation means that oral rehydration therapy can begin earlier. If the parents also know that they should keep on feeding the child throughout the illness and that the solution should be used to replace body losses as soon as the diarrhoea begins, then most of those 5 million child deaths per year could be prevented.

In all of this, the central challenge will remain the creation of support for ORT among the health professionals, understanding within the community and confidence among mothers (see panel p. 11). Several times, ORT campaigns have foundered because mothers who knew how to make an effective oral rehydration

**Fig. 1.12 Developing countries producing oral rehydration salts**

| REGION | COUNTRY |
|---|---|
| AFRICA | ETHIOPIA<br>LESOTHO<br>MOROCCO<br>MOZAMBIQUE<br>ZAMBIA |
| AMERICAS | ARGENTINA<br>BRAZIL<br>COLOMBIA<br>COSTA RICA<br>DOMINICAN REPUBLIC<br>ECUADOR<br>EL SALVADOR<br>GUATEMALA<br>HAITI<br>HONDURAS<br>PARAGUAY<br>PERU |
| EASTERN MEDITERRANEAN | AFGHANISTAN<br>EGYPT<br>PAKISTAN<br>SYRIAN ARAB REPUBLIC<br>TUNISIA |
| SOUTH-EAST ASIA | BANGLADESH<br>INDIA<br>INDONESIA<br>NEPAL<br>SRI LANKA<br>THAILAND |
| WESTERN PACIFIC | CHINA<br>DEMOCRATIC KAMPUCHEA<br>MALAYSIA<br>PHILIPPINES<br>REPUBLIC OF KOREA<br>VIETNAM |

*Source: Programme for Diarrhoea Control. Third Programme Report, 1981-1982. WHO/CDD/83.8 Geneva.*

## Nicaragua and Honduras: ORT cuts deaths

Because child diarrhoea and the malnutrition that goes hand in hand with it were such deadly scourges in Nicaragua, UNICEF's emergency assistance at the end of the civil war in July 1979 was concentrated on oral rehydration. Twenty-three oral rehydration units were established, with trained staff distributing oral rehydration salts free of charge and teaching mothers how to mix them at home. The units soon showed their effectiveness, and the emergency effort rapidly turned into a priority national programme.

The government used every available means to inform the public about oral rehydration. All the mass media were co-opted. The campaign was splashed across billboards, and leaflets, comic books, and posters were distributed nation-wide. The 80,000 young workers of the mass literacy campaign carried the message to every part of the country, along with the advice to continue feeding children during diarrhoea. Monthly reports from the oral rehydration units were widely circulated so as to dispel any doubts the medical profession might have.

By 1982 there were 334 units in operation, with a steady stream of child patients – more than 300,000 so far. *And diarrhoea has fallen from first to fifth place as a killer of Nicaragua's children.*

In Honduras, likewise, diarrhoea has traditionally been the foremost cause of infant and child mortality, and an intensive public information campaign has been mounted to combat it.

Radio was the principal channel for the Honduran campaign. One 60-second radio spot – a song extolling the benefits of breastfeeding – quickly became a national hit; it was always followed by an announcement urging the use of Litrosol, a locally-packaged brand of oral rehydration salts. Other radio spots, some of them humorous, covered related topics such as the importance of hygiene in preparing a child's food.

Distributed simultaneously with the radio campaign was a large poster of a mother breastfeeding her child, complete with rose, laurel and the campaign emblem of a red heart. Other eye-catching posters gave instructions on why and how to use Litrosol.

Mayors, midwives and health workers were given stocks of Litrosol packets and they raised flags outside their homes, displaying the red heart, to identify them as dispensers of the salts.

A year after the launching of the campaign the proportion of diarrhoea cases being treated with Litrosol rose from zero to 50%. Moreover, 95% of women surveyed after a year knew about Litrosol and how to use it. *In the most heartening finding of all, the death rate from diarrhoea in children under two fell by 40% within a year and a half.*

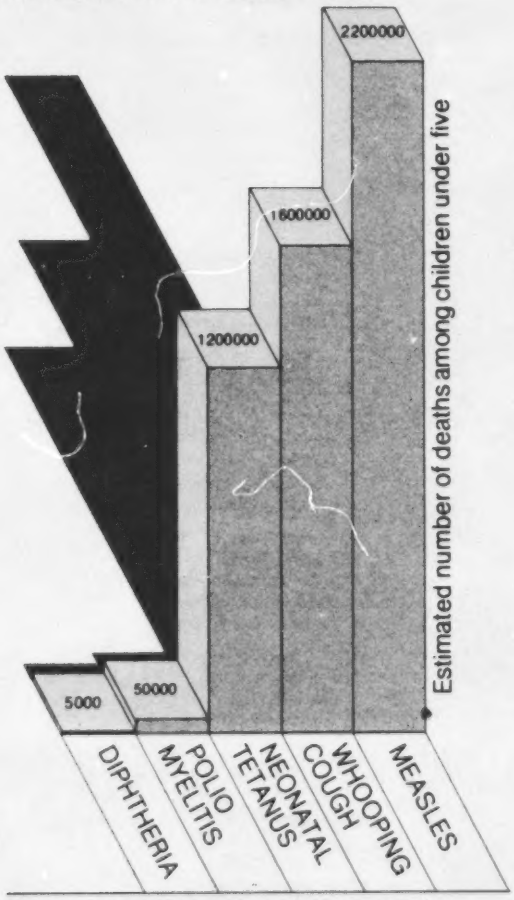
mixture did not have the confidence to use it when the time came (see panel p. 9). But once created, a parent's confidence in his or her own ability to bring about improvements in family health will probably not stop at ORT.

The campaign to promote the knowledge and use of oral rehydration therapy was given a major boost in June of 1983 when experts and practitioners from all over the world convened at the International Conference on ORT in Washington D.C. to share recent experiences and plan future strategies. The Conference (sponsored by US AID, WHO, UNICEF, and the International Centre for Diarrhoeal Disease Research, Bangladesh) reached a consensus on all the fundamental points – that diarrhoea is a major killer and debilitator of children; that ORT is a safe, affordable and effective therapy; that the right basic chemical composition of the salts is generally agreed upon; and that the challenge now is how to put the new technology at the disposal of all who need it. *'Much progress has been made,'* said Dr. Lincoln Chen in his summing up of the Conference's proceedings, *'much more needs to be done, and done soon. Oral rehydration therapy is increasingly capturing the imagination of the policy makers, the scientists, and the public.'*

Meanwhile, further advances in the therapy itself are still being made. In the last two years, the International Centre for Diarrhoeal Disease Research in Bangladesh (a pioneering institute which has been given substantial support by the United States Agency for International Development and by the United Nations Development Programme) has run successful field-trials with an oral rehydration solution based on ground-rice boiled into a thin soup with only a three-finger 'pinch' of salt added. Other cereals – all of which contain the necessary glucose – could be used in the same way. Even cheaper and more available than sucrose or sugar-based solutions, these cereal-based salts have even less risk of side effects and can shorten the duration of diarrhoeal infection. And even without the chicken or vegetables which can be added, they can help in the vital task of maintaining nutrition and protecting growth even through bouts of diarrhoeal infection.

Research is now needed to prove the viability of the cereal-based salts and to find and test the combinations of locally available ingredients from which effective oral rehydration solutions can be made. But the more difficult challenge is to put what is already known at the disposal of millions of families who need it. And just as glucose and salt are the two vital ingredients of the 'technological breakthrough', so support of the national community through all available means of communication and the rise of new kinds of local community development workers are the two vital ingredients in the 'social breakthrough' which is as necessary as the salts themselves if ORT is to play its part in a child health revolution.

**Fig. 1.13 Total child deaths from immunizable diseases 1980**




Note: No reliable estimates available for tuberculosis
*Source: Based on WHO estimates*

## Expanded Immunization

Every six seconds, a child dies and another is disabled from a disease which can be immunized against (See Figure 1.13). Many more suffer setbacks to normal health and growth.

Immunization against the six major communicable diseases of childhood – measles, tetanus, whooping cough, diphtheria, poliomyelitis and tuberculosis – costs approximately $5 per child. Most of the $5 is for the delivery system – the vaccines themselves cost only 50 cents. To immunize every one of the 100 million children born each year in the developing world would therefore cost approximately $500 million a year. To compare the cost of such benefits with the cost of weapons of war has become a cliché of development literature. Yet it may perhaps bear pointing out that this sum of $500 million needed to prevent the deaths of five million children a year and the disability and malnutrition of many millions more is equivalent to the cost of only ten of today's most advanced fighter planes.

The case for a campaign to immunize every child does not need to be clothed in argument. The barest facts will do. But the role of immunization as a weapon in the child health revolution is even greater than the saving of the lives of 5 million children a year and the preventing of disability in the lives of 5 million more. All of the immunizable diseases – but especially measles and whooping cough – are also driving forces in that cycle of malnutrition and infection which sets back the growth of millions of those who survive the infections themselves.

Measles, for example, was found in one African study to be the 'precipitating cause' in half the cases of hospitalisation for malnutrition. And as the growth chart on page 15 shows, there is also a synergistic reaction between the different infections themselves. In the case of this particular child, it was measles and diarrhoea which set back the child so severely that there was no resistance left when whooping cough struck only a few weeks later. The formal death certificate simply said 'whooping cough'.

All infections are nutritional setbacks. Often, the climb back to normal weight and growth takes several weeks. Immunization against the six main infectious diseases of childhood would therefore be a partial 'immunization' against malnutrition itself. And it is because it strikes against infection *and* malnutrition that immunization is one of the sharpest tools for cutting into the vicious cycle and reducing the severity and frequency of setbacks to the normal development of the child in its most formative years.

Given the fact that immunization can play such a vital part in protecting healthy growth, and given the fact that the necessary vaccines have long been available at a very low cost, why is it that no more than 10% to 20% of the world's young children are now immunized? (See Figure 1.14).

At first sight, immunization would appear to be a relatively easy or 'clean' intervention: the process itself is quite simple; it produces dramatic results; it has the appeal of modernity without requiring any deep-seated changes in attitude or behaviour. Yet a second look reveals some less simple elements: only certain vaccines can be combined into the same 'shot'; immunity may require three separate visits; BCG (tuberculosis) injections should ideally be given at birth; anti-tetanus vaccine should be given to the mother in pregnancy; other injections should begin as soon as possible after the second month – except measles which should wait until the ninth month; and all of this has to be permuted into a plan to immunize 100 million children a year – every year – with vaccines which must be kept refrigerated from the day they are made almost to the day they are used.

Add to this poor transport and communications; illiteracy and scattered populations; the absence of electricity and the shortage of fuel; the scarcity of skilled manpower and the limited outreach of health services – and it becomes obvious that immunization is not as simple as it looks.

To compound the problem, probably a majority of uneducated parents are reluctant to bring their children three or four times for inoculations which may cause temporary fevers and restless nights. Until a recent intensive media campaign, many of the immunization units in Karachi, for example, were vaccinating only about ten children a day. In many countries, only a minority of all the children born are brought for the first injection, only half of those turn up for the second, and only half of those come for the third – thereby missing out not only on complete DPT protection (against diphtheria, pertussis and tetanus) but also on the vital measles injection which is often administered during that third visit. The education and involvement of parents is therefore a greater challenge than the technology of vaccines or the financing of immunization campaigns.

In the face of all these difficulties, but with the momentum of the successful eradication of smallpox behind it, the World Health Organization launched its Expanded Programme of Immunization (EPI) in 1977 with the aim of assisting all nations to immunize all children against all six diseases by 1990.*

At about the half-way point, there are many impressive achievements. More than 130 places in the developing world have so far launched their own expanded programmes of immunization. World-wide more than

*UNICEF itself works closely with WHO in this programme and is the world's largest supplier of vaccines and 'cold chain' equipment.

## Malawi: measles down 60%

The people of Malawi suffer from poor health even by the standards of their neighbours in south-east Africa. The leading cause of sickness among children is malaria, followed by respiratory and diarrhoeal diseases. The main cause of child deaths, however, is measles (over 18 per cent of all inpatient deaths in 1979), trailed by pneumonia, malaria and nutritional deficiencies. Besides being especially vulnerable to all these illnesses, young children also have whooping cough to contend with. Chronic malnutrition adds to their burden.

Protection against infectious diseases is accordingly a high priority in Malawi's maternal and child health care programme, set up in 1975. Immunizations are part of the routine duties of the clinic nurses and mobile teams which serve most of the country.

The childhood immunization programme was evaluated in early 1983 and found to have registered remarkably good results. Just over half of the children in the sample had been fully immunized against the principal infectious diseases of childhood. More precisely, 60% had been fully vaccinated against diphtheria, pertussis (whooping cough) and tetanus, and 72 per cent had been fully immunized against polio. Eighty-six per cent of the children had been protected against tuberculosis and 60% had received measles shots.

Even though the coverage is not yet complete, immunization has made its mark on the incidence of disease in Malawi. The number of outpatient referrals for whooping cough, for example, went down from 27,595 in 1978 to 18,627 in 1981, and referrals for measles fell from 246,511 in 1978 to 84,610 in 1981.

These figures have been achieved in the face of considerable obstacles. Recent shortages of fuel and transport, for instance, have meant that the mobile teams could hold mother-and-child clinics only once a month, or sometimes not at all, instead of twice a month as planned. For the same reasons, vaccines and supplies have not always been available either of late. The evaluators found, for example, that around a third of the health units they visited had no polio vaccine and a fifth had no tuberculosis vaccine.

Since the success of an immunization programme depends on its being accepted by the public, the campaign also monitored parental awareness of the need for immunization. They found that 80% of young mothers with children under three, selected at random, could define immunization and its purpose. They also knew which were the target illnesses and were able to give details of most of them: 89% could describe the symptoms of measles, 81% whooping cough, 75% polio, and 62% tuberculosis. Nine out of ten mothers understood which immunizations their children had received, and all of them knew that they had to return for more.

The credit for their being so well informed must go largely to the staff of Malawi's mother and child health care programme. A quarter of the mothers had obtained their information from friends, husbands and parents, but fully two thirds of them had received their education in immunization from health staff, mostly at ante-natal clinics.

1,000 senior national and international EPI staff and 10,000 middle-level managers have been trained. Many countries – including Brazil, the Congo, Gambia, India, Kenya, Lesotho, Malawi, Mozambique, Oman, Sierra Leone, Sri Lanka, Tanzania and Thailand – have made significant progress.

But overall, less than 20% of the children born this year into the developing world will be protected by immunization. And the target of immunizing all children by 1990 is not now going to be even nearly met unless there is a sudden surge of acceleration towards it.

Technological breakthroughs are becoming available to make that re-acceleration easier. New vaccines can retain their potency for longer periods and at higher temperatures. Solar-powered refrigerators, colour-change temperature warnings, and low-cost sterilisation techniques are all now undergoing trials. But the great barriers to be overcome are no longer technological. The problems which stand in the way of immunizing all children are the problems of parental education and community involvement, money and management, organisation and training.

To solve such problems, immunization campaigns usually need to be integrated into other primary health care and community development networks which can provide *continuity of contact* between people and immunization services.

Unlike smallpox, which could be eradicated because humans were its only carriers, diseases like tetanus, whose spores are carried in the earth itself, cannot be eradicated. The challenge of immunization programmes is therefore not the challenge only of the one-off mass campaign but the double challenge of building a permanent system capable of delivering vaccines to every infant every year and of educating every new generation of parents about the need to bring their infants for the full course of injections.

To meet that challenge will mean mounting much more intensive and extensive campaigns to involve and inform communities and families about the demands which they must make of immunization services and the demands which immunization services must make of them. The chances of all children being present at the right times and the right places three times a year every year are considerably enhanced in communities which understand the reasons for this schedule and are involved in planning the how and the where and the when. So even for the 'clean intervention' of immunization, social and organisational breakthroughs – and community education – are as important as technological progress if immunization is to play its potentially decisive role in a child health revolution.

Money is important. The present annual investment of $72 million needs to be more than quadrupled over the next six years if the 1990 target for universal immunization is to be met. At the moment, 80% of the money is coming from the developing countries themselves.

But more important still is the mass mobilisation and the involvement of every possible means of communication in order to bring all parents to the point where they demand immunization for their children and understand that they must complete the full course of injections.

### Synergisms

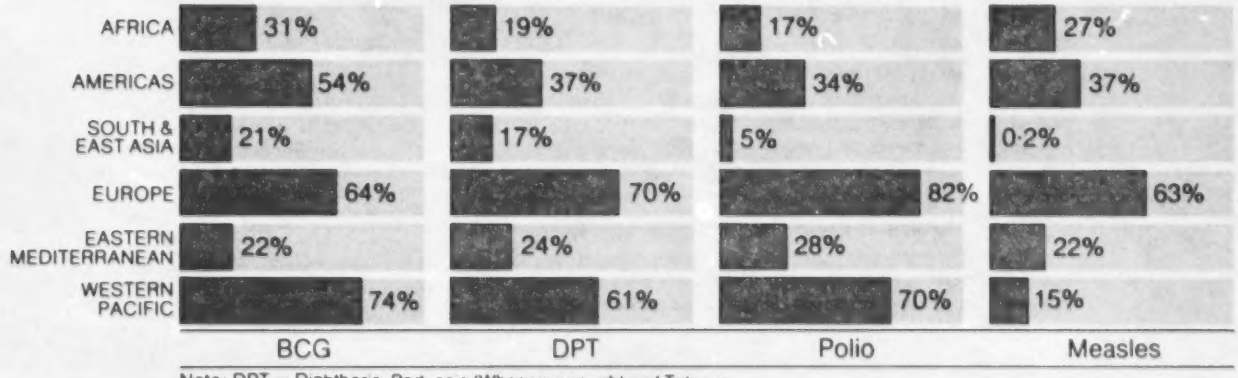
The four strategies discussed so far – growth monitoring, the promotion of breastfeeding, oral rehydration therapy, and expanded immunization – are strategies which are in a class of their own at the present time. They are low-cost. They are available now. They are almost universally relevant. And they achieve rapid results.

More than that, such actions carry the flag for primary health care itself. They reverse the usual relationship between doctor and patient by using knowledge and technology to empower rather than alienate those whom they are designed to serve. Rather than making people passive and dependent recipients of health care, they enable people to become informed activists in the protection of their own and their families' well-being. And in so doing, they promote the cause of self-reliance and people's participation in health.

Most important of all, these four simple actions are aimed at the heart of the world's major child health problem – the synergistic alliance of malnutrition and infection which now attacks hundreds of millions of our young children during the most vital years of mental and physical growth.

So far, the four strategies have been discussed individually. But just as malnutrition and infection join in a synergistic alliance to attack the health and growth of young children, so the different strategies ranged against them can also act in concert to defeat that alliance. A breastfed child or an immunized child is less likely to contract diarrhoeal infections; a child with fewer episodes of diarrhoea is less likely to be malnourished; a child who is less malnourished is less likely to contract infections. And every infection and weight loss

**Fig. 1.14 Percentage of children immunized in the first year of life**




Note: DPT = Diphtheria, Pertussis (Whooping cough) and Tetanus

*Source: WHO Expanded Programme on Immunization Global Advisory Committee Meeting October 1982*

prevented – whether it be prevented by immunization or breastfeeding or ORT or by careful monitoring of growth – makes another break in the cycle, puts more space in between setbacks, allows more time for recovery, and makes subsequent infection or weight loss a little less likely. In short, the combined impact of these four principal strategies can be considerably greater than the sum of their individual contributions.

The combined potential of these breakthroughs for child survival and growth is today very similar to the potential which high-yielding varieties (HYVs) of wheat and rice held for world food supplies in the late 1950s and early 1960s. At that time, doubling and even trebling the yields of first wheat and then rice became scientifically possible. But the power of the discovery was only a *potential power* because the HYVs needed the widespread availability of fertiliser, pesticides, controlled irrigation, and thousands of agricultural extension workers to train farmers in the management of the new seeds. In the late 1950s, hardly any of these essential ingredients of the Green Revolution existed on any significant scale in the low-income countries. As with the possibility of a children's revolution today, breakthroughs in organisation were needed to liberate the potential of breakthroughs in knowledge and technique.

By the mid-1960s, an explosion of training, tube-well drilling, and fertiliser use, especially in Asia, had begun to liberate this potential. Suddenly, the new seeds were doubling and trebling yields not in the demonstration zones of scientists but in the fields of farmers.

The organisational process by which the technological breakthrough of HYVs was translated into huge harvests holds many lessons for the present task of translating the potential of such breakthroughs as oral rehydration therapy into improvements in the health and well-being of children. First of all, it was noticeable that in every case where the potential of HYVs was fulfilled on a significant scale and in a short period of time, the mainspring of the achievement was the commitment of national governments at the highest levels. In India, Pakistan, the Philippines, and Turkey, for example, Heads of State or senior ministers personally took charge of the task. Principally because of this commitment, it became possible to mobilise the other ministries and government departments whose involvement was needed to make the Green Revolution happen. And it is this mobilisation at different levels and across different sectors of a nation's life which is the second important lesson to be learned from the experience of liberating the technological breakthrough of high-yielding seeds. For the management of this achievement was not the exclusive preserve of the Ministry of Agriculture. Ministries of Finance were involved in arranging the foreign exchange to buy vast quantities of fertilisers and pesticides; Ministries of Transport were involved in the problems of conveying both inputs and the doubled and trebled outputs which were the result; Ministries of Commerce were involved in arranging credit for thousands of farmers to invest in the process. Ministries of Information helped to spread the word about the revolutionary potential of HYVs. And important as they were to the Green Revolution, Ministries of Agriculture could not have achieved all this alone – any more than Ministries of Health alone can bring about a child health revolution today.

Finally, the Green Revolution offers the moral of mass mobilisation. Millions of farmers had to be reached, informed, given credit, persuaded, and backed up by technical expertise. Mass-media interest played a big part in communicating the potential of the break-

# China: overcoming odds

Over the past 34 years, the People's Republic of China has demonstrated on a massive scale that great strides forward in health need not wait upon advanced levels of economic development. With an estimated GNP of only $300 per person per year, China is still among the world's poorest nations. Yet its infant mortality rate is among the very lowest in the developing world.

In 1981, the *Beijing Review* reported that such scourges as plague and typhus had been virtually wiped out. The incidence of malaria and schistosomiasis had been sharply reduced, and cases of polio had fallen to just over one per 100,000 population. Tuberculosis, the leading cause of death in pre-liberation China, killed an estimated 200 people per 100,000 population a year; in 1975, largely as a result of immunizations, it carried a mortality rate of 43 per 100,000 and had moved to ninth place as a cause of death.

In Tianjin, the country's third largest city, the reduction of childhood diseases between 1950 and 1978 ranged from 75% for measles to nearly 100% for diphtheria.

China has waged its battle against these diseases almost entirely without the technology normally considered a prerequisite to immunisation.

A particular problem has been the lack of electricity or equipment to keep polio and measles vaccines at the necessary low temperatures. As recently as September 1982, a WHO mission noted that none of the health facilities it visited in Hubei province had refrigerators. But solutions have generally been found, whether it has meant transporting children *en masse* to the nearest health centre with a refrigerator or taking advantage of China's freezing winters to run polio campaigns.

Immunization has been only a part, albeit an integral one, of China's health policy since 1950. Despite some shifts in approach, this policy has never wavered from the principle that preventive care should take precedence over curative services – a traditional tenet of Chinese medicine.

In the 1950s and early 1960s this principle took shape primarily in massive campaigns against such major health problems as schistosomiasis, malaria, venereal diseases and the 'four pests' (flies, mosquitoes, rats and bedbugs). Epidemic prevention centres were set up to mount equally energetic immunization drives.

The years after 1965 brought a new emphasis on decentralisation and on the provision of health care in the countryside, home of some 850 million of China's billion inhabitants. The main responsibility for immunizations shifted to the barefoot doctors, the paramedics who are probably the best-known feature of China's health system. Working in the production brigades or in the factories and neighbourhood health stations of the cities, the barefoot doctors have ensured that most of the country's population receives at least the basic elements of health care.

China's achievements in infectious disease control should not be considered in isolation: policies of full employment, a guaranteed food supply and a high level of literacy have all played a vital part. But its immunization record does suggest that technological shortcomings need not be a major stumbling-block, provided that a country is wholeheartedly committed to protecting its children from disease.

through and farmers' associations of all kinds were deeply involved. At the same time, thousands of agricultural extension workers were recruited and trained for the task of communicating to farmers precisely how the new seeds were to be managed.

Political commitment at the highest levels of government; the involvement of all relevant ministries; the bringing together of a complex but mutually reinforcing 'package' of training, financing, education and transport and an equivalent technological 'package' of seeds, fertiliser, pesticides and irrigation; and the mobilisation of every available means of linking the breakthrough in knowledge to those whose lives could be improved by it – these are the lessons which the experience of the Green Revolution offers to the present potential for an even more important revolution in the survival and healthy growth of children

After reading of the potential of child growth-monitoring charts in last year's *State of the World's Children* report, for example, the Chief Minister of Kashmir contacted UNICEF's Regional Office in New Delhi to ask for assistance in procuring one million growth charts. Discussions followed about how to bring a 'package' together to bring out the potential of the chart: how to provide scales calibrated in the same way as the charts; how to advise mothers on breastfeeding and weaning; how to provide supplementary food for the poorest households; how to introduce oral rehydration therapy and immunization campaigns; how to work towards other basic services; and how to go about collecting data for nutritional surveillance and early warning.

Without the 'package' of organisational and technological synergisms, the full potential of these breakthroughs in knowledge and technique would not be realised. Without the commitment of a political leader who could mobilise different departments of government, the 'package' would not be possible.

# Mother of Change

If progress for children is to be accelerated despite difficult economic times, then the campaign for more resources for development has to be combined with a search for ways to improve the ratio between resources and results. Four such ways have already been discussed. But recent research in the developing world is also highlighting three more sets of changes which, though deeper-seated – and therefore more difficult and more costly – are of such potential significance for the health and well-being of the world's children that they must also now be counted among the breakthroughs in knowledge which make possible a child health revolution. Indeed so powerful are these levers for increasing child well-being that their effective incorporation into national child survival strategies could reduce child deaths and child disabilities by two-thirds within ten or fifteen years.

All three of these changes – in quite different ways – imply the further empowering of women.

## Food supplements

One of the least-known but most important facts about infant deaths in the developing world is that the 10% – 15% of babies who are born with low birth-weights (below 2,500 grams) account for between 30% and 40% of all deaths in the first year of life. In other words, low-birth-weight babies are approximately three times more likely to die in infancy (See Figure 1.16). Among those who survive, low birth-weight has also been shown to be associated with longer and more frequent illnesses and with mental and physical impairments.

Reducing the incidence of low birth-weights, if it could be done, would therefore be a breakthrough of enormous significance for child survival and child health.

In the industrialised world, low-birth-weight babies are usually premature babies. In the developing world, low-birth-weight babies are usually 'full-term' babies; the reason their birth-weight is low is that they have been malnourished in the womb. And one of the main reasons for that is that the mother herself has been malnourished in her pregnancy.

On a subject of such obvious importance to the health of the world's children – and women – it is astonishing that there should be so little research. But the one major study of an attempt to prevent low birth-weights – by preventing malnutrition in the womb – has shown that it is possible and possible at a relatively low cost. In doing so, it has put another potentially powerful weapon at the disposal of a child health revolution.

The study, undertaken by the Institute of Nutrition of Central America and Panama (INCAP) in four villages in eastern Guatemala, showed that a food supplement of only a few hundred calories a day – given to women in the last three months of pregnancy – could reduce the incidence of low birth-weight from over 30% to only 4% or 5% and associated infant deaths by more than 50% (see Figure 1.15).

One other study, in India, has also shown that birth-weights can be significantly raised by an average of 300 grams through a daily supplement of 500 calories and 10 grams of protein for women in the last three months of pregnancy. A similar study, also in India, concluded that iron, folic acid, and food supplements for pregnant women were the single most cost-effective means of reducing peri-natal mortality among infants.

Even though we are now talking about extra food for the poorest mothers – rather than any general food subsidy – food supplements have a reputation for being both expensive and inefficient. Both accusations arise from the difficulties – and the costs – of actually targeting such supplements to those who are most in need. In one case in Colombia, for example, the provision of an 850 calorie-a-day food supplement to pregnant women only achieved an increase of about 130 calories a day in the actual intake of the women themselves. The reason was that much of the extra food went to other members of the family or was used in the place of food which would normally have been bought. But given the potential benefit of food supplements to the health of the mothers and children in greatest need, these problems cannot be regarded as insuperable. And once again it is the combination of scientific and social progress which now offers a way forward.

Scientific research has made its contribution to cost-effectiveness by making it possible to predict the low birth-weight risk even quite early in pregnancy. Women who weigh less than 90% of a woman's normal weight-for-height at the onset of pregnancy, or who have an upper arm circumference of less than 23.5 cm, or who fail to gain 1.5 kg. a month in the last 3 months,

or who are over 35 years old, or who have had 4 or more pregnancies, or who have previously given birth to low-birth-weight babies, or who are anaemic, or who have placental malaria – would all be candidates for food supplements both to improve the health of the mother and to reduce the risk of low-birth-weight babies.

Social progress – in the increasing number of community development organisations, primary health care services, paraprofessional development workers, rising literacy and new communication channels – can translate that theoretical knowledge into practical benefits. A community development worker with a simple arm-circumference measuring band, for example, can identify women most at-risk. If the community itself is also involved and informed, then the special needs of the most vulnerable groups are more likely to be understood and the supplementary food made available *for* them is more likely to be consumed *by* them.

For the poorest mothers, that food supplement in pregnancy not only reduces the risk of low birth-weight but also builds up the 'energy bank' which a woman needs to breastfeed her baby without depleting her own body. If that supplementary feeding for women at-risk can continue at about the same level (approximately 500–600 calories per day) after the birth itself, then the quality and quantity of breastmilk can be maintained for a longer period of time – so extending the vital protection which breastfeeding affords to child health and growth in those vital early months.*

Finally, food supplements may also be necessary at the time of weaning itself – the time when so many millions of children slip into that downward spiral of malnutrition and infection.

For perhaps one third or more of the children in poor communities of the developing world, the absolute shortage of food in the house is the main cause of malnutrition. For such children, normal growth is almost impossible. Breastfeeding may protect them for the first few months. Oral rehydration therapy may prevent them from losing weight or dying of dehydration. Immunization may save them from some infections. Growth charts may inform their mothers that something is wrong. Health workers may advise on what can be done. But without enough of the right kind of food when weaning begins, growth cannot be normal, resistance cannot be kept up, and impairment of the child's development cannot be prevented.

For such families, extra food in the house is therefore an indispensable part of any strategy to protect the normal healthy growth of children.

The reason for the lack of food in the house is either the lack of money to buy food, or the lack of a large enough plot to grow food, or the lack of the means to make land produce food. And the solution to these problem will require, above all else, agricultural reforms, land tenure changes, more training and credit for small farmers, and increasing employment for poor people.

In the meantime, the malnutrition of so many children in the most formative years of their lives is itself one of the forces which undermines progress

*Maternal malnutrition does affect the duration, quantity and quality of breastmilk – in that order. But even for the babies of malnourished mothers, breastmilk is still better than any artificial substitute. In Sri Lanka, for example, a study of four-to-eight-month-old infants born to poorly-nourished mothers showed that 76% of breastfed babies and only 29% of artificially fed babies gained 90% of normal weight-for-age.

## Nepal: halving deaths

In 1982, the government of Nepal had deployed 714 full-time paramedics in 492 *panchayat* or district clinics. On taking up their posts, the first task of these intensively trained health workers was to visit every family in the *panchayat*. Thereafter, regular follow-up visits concentrated on teaching oral rehydration therapy to parents and on advising about nutrition, sanitation and hand-washing.

Since 1976, an additional 1,600 village health workers, with only six weeks of training, have been working in another 298 health posts in 23 out of Nepal's 75 districts. Their main tasks are to begin building integrated health services, calling on the support of different government ministries where necessary. In practice, they are involved in malaria surveillance, maternal and child health care, oral rehydration therapy, health education, leprosy and tuberculosis treatment, minor first aid, family planning advice and assisting in the organisation of vaccination campaigns.

Although there are still many difficulties, and both the training and the back-up of the 1,600 village health workers could no doubt be improved, both of these primary health care approaches have rapidly shown their potential for improving health in Nepal. After only two years, a survey of four villages containing 6,000 households showed that infant deaths had fallen sharply. *In two villages covered by full time health workers in panchayat clinics, the infant mortality rate had been almost halved – from 123 to 65 per 1,000. In the two villages with village health workers, the mortality rate had fallen by a quarter – from 102 to 76 per 1,000.*

Commenting on the different impacts, the authors of the survey report pointed out that the health workers based at the *panchayat* clinics had been able to spend a considerable amount of time educating individual mothers about oral rehydration therapy. Village health workers, on the other hand, had to spread their time and effort over a much wider variety of tasks and over a much wider territory, meaning that less time was spent in supporting individual parents' efforts.

towards that ideal. For in its effect on the growth of individuals, and eventually on the capacity of communities, hunger perpetuates that cycle of low energy, low productivity, low income, and low levels of investment in community development, which result in poor health and nutrition being perpetuated from generation to generation.

Somewhere, somehow, that cycle must also be broken. And whilst the pressure must be kept up for fundamental political and economic change, direct intervention to get more food to the families most in need is also a fundamental requirement.

To make such food supplements affordable and cost-effective, they will again have to be targeted to those mothers and children who are most in need. And again it is the spread of primary health care, the use of growth charts, and community involvement in health, which can make that targeting possible.

It is important for the community and the family to know, for example, that the growing body of a young child needs twice as much protein and three times as many calories, per kilo of body weight, as an adult. It is also important to know that, because a young child's stomach is smaller, feeding needs to be more frequent.

In practice, applying such knowledge is not nearly as easy as it sounds for the poorest families. With 70% to 80% of family income being spent on food, poor mothers have to 'go for bulk' rather than nutritional balance when they shop for food. From an adult's point of view, that is usually the right thing to do in the circumstances. But a child simply cannot eat the cheaper low-protein foods like cassava in sufficient quantity to derive enough protein for growth. To get the same amount of protein as is contained in a handful of green beans, for example, a child would have to eat the impossible amount of 2.5 kilos of cassava.

Many attempts have been made by governments, international organisations, and commercial enterprises, to manufacture and market 'formulas' which provide the balanced weaning food which a child needs at a cost which the mother can afford. *Faffa* in Ethiopia, *Supramine* in Algeria, *Nutri-Nugget* in India, *Incaparina* in Guatemala – altogether some 86,000 tons a year of such formulated foods are manufactured for infants in 78 different countries. But in almost all cases they have proved to be too expensive to be within the reach of the very poor.

The more promising way forward to meet that need is again the spread of primary health care workers and women's organisations who can work with groups of mothers to prepare affordable weaning foods within the community itself. Skinned vegetables and soft fruits, mashed or ground and mixed with local cereals, can avoid the costs of packaging, marketing, transport and storage and are available to the poor at less than one-fifth of the cost of even subsidised weaning formulas.

This approach has multiple advantages – it can be integrated, for example, with hygiene education – and at no other time is the cleanliness with which food is prepared and stored as important as it is during weaning.

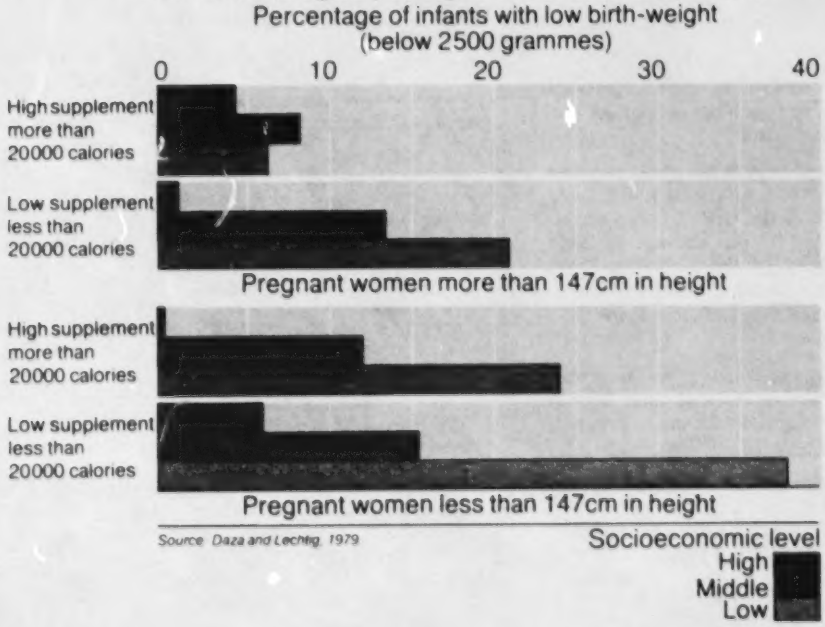
At the same time, the use of growth charts can be introduced and used both as a method of nutrition education, as a means of monitoring the nutritional status of a community's children, and as a device for identifying children who are at special risk and in need of food supplements.

### Family spacing

Food subsidies – of some kind – are therefore going to be essential if the growth of children of the very poorest families is to be protected and if deaths and disabilities are to be even more substantially reduced.

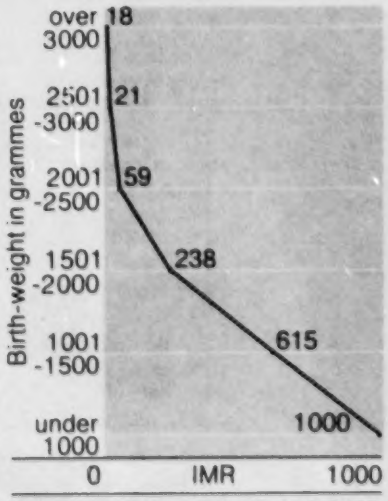
Unfortunately, knowledge of the dangers of low birth-weight – and the means of preventing it – is slow to spread. Out of several hundred supplementary

**Fig. 1.15 Effects of extra food in pregnancy on birth-weights, villages in Guatemala, 1979**




Source Daza and Lechtig, 1979

**Fig. 1.16 Infant mortality and low birth-weight**




Note: Figures for New Delhi, India, 1969-1974
Source Ghosh, et al., 1978

feeding programmes recently surveyed by the Harvard Institute for International Development, for example, only 15% saw fit to include undernourished pregnant women among the eligible.

By contrast, the second of the changes in the lives of women which could have a dramatic impact on child health and growth is already gaining ground rapidly in the developing world.

Ten years ago, Dr. David Morley wrote that '*medical workers, when caring for a mother and her young child, will come to realise that delaying the next conception and extending the interval between births are quite as important a part of health care as seeing that the latest child is adequately immunised*'. Since then, the rapid spread of family planning has provided evidence from almost every country that birth-spacing can indeed have a revolutionary impact on maternal and child health. Studies in India, Turkey, the Philippines and Lebanon, for example, have shown that infant mortality rates for babies born within one year of a previous birth are between two and four times as high as for babies born after an interval of two years or more. A similar survey of 6,000 women in India has shown infant mortality rates of approximately 80 per 1,000 where the interval between births was three to four years – rising to 200 per 1,000 when the interval between births was less than one year (see Figure 1.17).

Empowering mothers with the knowledge and the means to increase the interval between births is therefore a crucial contribution which family planning can make to health. But studies in both industrialised and developing countries have also shown that 'too many' can be almost as dangerous as 'too close'. Research in China, El Salvador, Chile and Britain, for example, has shown that the chances of survival for the first and second child are slightly higher than for the third child – and very significantly higher than for the fourth and fifth child in a family. Infant mortality rates in El Salvador were found to be around 60 per 1,000 for first-born children rising to 160 per 1,000 among fifth and subsequent children (see Figure 1.19).

**Fig. 1.17 Birth spacing and infant mortality**

Note: Space between births is the interval between the termination of the preceding pregnancy and the birth of the infant.

*Source*: Omran, A.R. & Standley, C.C., ed. *Family Formation Patterns and Health*. Geneva, World Health Organization, 1976, p.215 (data from South India Sample, 1971-1975, 6541 women).

# Bangladesh: healing at home

In Bangladesh, a quarter of a million children die each year from the dehydration and malnutrition linked to diarrhoeal infections. Most of them could be saved by simple oral therapy – if it were available.

The country's four factories for oral rehydration salts produce 2.5 million packets a year – as against an estimated need for 20 million. But even if production could be stepped up, three quarters of the population live beyond the reach of health services or drug stores and more than three quarters of all mothers would not be able to read the instructions on the backs of the packets.

To try to overcome these problems, 900 field-workers of the Bangladesh Rural Advancement Committee are now working in five of the country's twenty districts teaching 2.5 million women how to prepare a home-made version of oral rehydration salts using ingredients available in every household – salt and molasses. A three-finger pinch of salt (*lobon*) and a four-finger scoop of molasses (*gur*) dissolved in the right amount of water add up to an oral rehydration mixture which has been shown to be effective.

Bringing this home-made solution to the villages remained the major hurdle. Travelling from their temporary quarters by foot, rickshaw and bicycle during the dry winter season, and by country boats during the monsoon, teams of oral rehydration workers go door to door in the villages, spending about 30–35 minutes with each mother and stressing the 'seven points' of successful treatment for childhood diarrhoea. Most important of all, mothers are taught that the attempt to 'dry up' the child by withholding food and drink.

One month after the oral rehydration teachers have left the area, a small monitoring team surveys 5% of the households visited to collect samples of the home-made oral rehydration solution and to ask mothers how many of the seven points they can remember. So far, the surveys have found that 98% of the women can prepare the home mix correctly and over 90% remember all or almost all of the seven points.

One possible reason for this success is that the oral rehydration teachers are paid by results – 16 cents for every women who can remember all of the seven points, 8 cents for every women who can remember 'nearly all', and only 4 cents for a woman who can only remember 'some'. If any woman cannot make up a mixture of oral rehydration salts correctly, the health worker who taught her receives nothing at all.

Even though the campaign is usually preceded by talks with the village men and the traditional healers and leaders of the community, many of the women who know how to make the oral rehydration mix do not use the technique when a child actually falls ill with diarrhoea. According to some surveys, usage rates vary between 8% and 60%. 'The difficulty lies in persuading village mothers to believe that such a simple thing can save a child from dehydration,' says Dr. Rahman, manager of the oral therapy campaign.

In October 1983, the campaign went into its second phase with the aim of covering half the nation by 1986.

Finally, births to women who are younger than 20 or older than 35 are also known to increase the risks to both mother and child. Studies in Algeria, Mexico and the United States have all concluded that a child born to a woman under the age of 20 is approximately twice as likely to die in infancy as a child born to a woman in her mid-twenties.* After the age of 30, the level of risk again begins to rise (see Figure 1.18).

These risks to life and health summarised by 'too close, too many, too old or too young' hold true for all income groups, though in each case the increase in risk is exacerbated by poverty. Even in the United States, it has been estimated that infant mortality rates could be reduced by almost a third if no women were to have more than three well-spaced births.

As relevant as any of these findings is a study which shows that most women do not need scientific surveys to tell them that too many births too close together is dangerous for their own and their children's health. Out of 21,000 women interviewed by WHO in several developing countries, nine out of ten knew that the health of both mother and child was better if there were fewer births and longer intervals in between. The recent World Fertility Survey has also reported that the proportion of women with three living children who want no more is over 70% in Sri Lanka, over 65% in Bangladesh, over 60% in Thailand and Peru, and over 50% in Costa Rica, Mexico, and the Dominican Republic (see Figure 1.20).

In practice, many women do not have either the means or the freedom to exercise that preference. World-wide, at least half of the women who are now at risk of an *unwanted* pregnancy are not using any effective method of family planning.

*Probably the major reason for this is that women who become mothers at a very early age tend to be both poorer and less educated.

Increasing women's own control over their own fertility is therefore a change which could clearly have a revolutionary impact on the health of mothers and the growth and survival of their children. And although there is a long way to go before that change is complete, recent progress has been, by any historical standards, remarkable. Only thirty years ago, there was not a nation in the world which was committed – even on paper – to the provision of family planning services. Today, 118 nations have adopted national family planning strategies and the speed with which the knowledge and the means to space child births has spread throughout the world is a tribute to the work of thousands of governmental and non-governmental organisations of all kinds who have helped to bring this change about. It is also one of the best possible omens for a child health revolution. Not only is the idea of family-spacing itself spreading, but many of the networks and organisations which have helped it to spread are now turning their attention to other aspects of maternal and child health. An example of how the rapid spread of different kinds of development worker can open up new horizons are the 7,000 family planning workers who brought the means and the knowledge of family planning to a majority of Indonesia's 150 million people in only seven years and who are now working on nutrition programmes and promoting the use of growth charts in Indonesian villages (see panel p. 13).

### Female education

For almost all children, the most important primary health care worker is the mother. For it is usually the mother's level of education and access to information which will decide whether or not she will go for a tetanus shot; whether a trained person will be present at the birth; whether she knows about the advantages of breastfeeding; whether her child will be weaned at the right time; whether the best available foods will be

**Fig. 1.18 Age of mother and infant mortality**

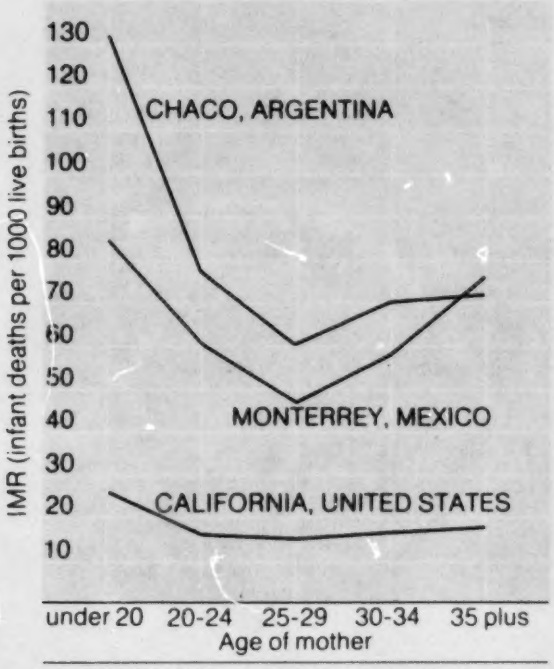
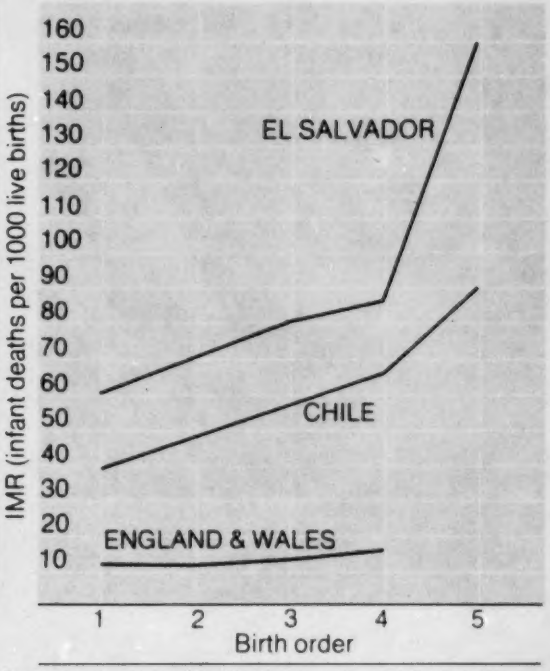



**Fig. 1.19 Family size and infant mortality**




Source: Maine D. Family Planning: Its Impact on the Health of Women and Children. The Center for Population and Family Health, Columbia University, New York, 1981

cooked in the best possible way; whether water will be boiled and hands washed; whether bouts of diarrhoea will be treated by administering food and fluids; whether a child will be weighed and vaccinated; and whether there will be an adequate interval between births.

It is therefore perhaps not so surprising that the children of more educated mothers have, in general, more chance of both survival and healthy growth (see Figure 1.21).

What is more surprising is the sheer power of the leverage which the educational level of the mother exerts on the well-being of the child – and the fact that this leverage retains so much of its power even in very poor environments.

In total, over 24 separate studies in 15 different nations have established that the level of the mother's education – even within the same economic class – is a key determinant of her children's health. In Pakistan and Indonesia, for example, the infant mortality rate among children whose mothers have had four years of schooling was found to be 50% lower than among the children of women who were illiterate. In eleven countries studied by the Latin American Demographic Centre (CELADE), the influence of the mother's education on the child's chances of survival was found to be stronger even than the level of household income. One particular study in Kenya has even gone so far as to say that 86% of the decline in infant mortality in that country over the last twenty years can be 'explained' by the rise in female education.

Empowering women by education is therefore the third of the improvements in the lives of women which could also have a revolutionary impact on the well-being of children. Whether she enters the work-force or not, investing in a minimum of four years at school for every girl is one of the most cost-effective investments which any country can make in its own future.

In some parts of the world, there is still a resistance to the idea of female education among those who fear that it might also lead to the emancipation of women themselves. And world-wide there is still a significant difference between the enrolment – and the school drop-out rates – of boys and girls. Among 6–11-year-old children in the low-income countries, for example, about 90% of all boys and a little more than 60% of all girls are enrolled in school. Usually, the reasons for this discrepancy are to be found more in the society than in the school itself. Even 'free' education is expensive when parents are too poor to easily afford books, clothes, shoes and transport. For girls – who are often wanted to help with household tasks and child care and for whom education is often not considered to be so necessary – this expense may prove too much. So an investment which could improve life tomorrow is withdrawn to help cope with life today.

Despite this persistent discrepancy, education for girls is a change which is well underway. The proportion of 6–11-year-old girls who are enrolled in school in the poorest half of the world, for example, has jumped from 34% to 80% since 1960 (see Figure 1.1). By any standard, that is remarkable progress. And because of what it can achieve for both women and children, the rise of female education deserves to be regarded as one of the great achievements of the last twenty years and one of the most hopeful signs for the next twenty. For that significant change in the education of girls during the 1960s and 1970s is now beginning to show through as a significant change in the proportion of mothers who are literate in the 1980s. And the fact that a much

# Colombia: small is saveable

The normal weight for a baby at birth is about 3 kilos. Anything below 2.5 kilos is considered 'low birth-weight' and the lower the weight the greater the risk to the infant's health and life. Of babies born below 1 kilo, for example, nine out of every ten will die in their first month. Even at 2 kilos, the risk to life is approximately ten times greater than for babies of normal weight at birth.

World-wide, more than 20 million low-birth-weight babies are born each year and almost a third of them die before reaching the age of one. The incubators and intensive care which are often needed to save them are only found in modern hospitals and are therefore not available to the vast majority of low-birth-weight babies who are born to very poor mothers.

Now, a revolutionary technique pioneered by San Juan de Dios Hospital, in Bogota, offers life-saving 'intensive care' to all low-birth-weight babies who need it whether they are born in a hospital or not. The new technique needs no technology. Its cost is zero. And it is based on breastfeeding.

Under the leadership of Dr. Edgar Rey, a team of Colombian paediatricians have begun introducing new procedures for low-birth-weight babies in the hospital's Mother and Child Institute. Instead of being placed in incubators, low-birth-weight babies are 'packed' close to their mothers – under the blouse or sweater right next to the breast. There the baby's temperature (a major problem with very low-birth-weight babies) is regulated by the mother's own body. And instead of bottle-feeding in a separate nursery – or being taken out of the incubator and breastfed only every few hours (another problem with low-birth-weight babies is that they often can't suckle for very long at a time) – the 'packed' baby can feed in small amounts as often as it likes.

The baby thus gains all the advantages that breast-feeding can provide – the best nutrition, immunity from infection, freedom from both diarrhoea and constipation, and the affection fostered by the closeness between mother and child. If the mother doesn't have enough milk, the baby is given guava juice with sugar and water – never a commercial milk substitute.

The Colombian team then took an even more unconventional step. As long as the baby is healthy, mother and child are sent home from the hospital as soon as possible – regardless of the baby's weight.

Overall, the results have been dramatic. Before the new techniques were introduced, all babies weighing less than 1 kilo died. Now, three quarters of them are being saved. And for those weighing between 1 and 1.5 kilos at birth, the death rate has dropped from 70% to only 10%.

At the moment, what has been learnt at San Juan de Dios Hospital is of benefit to only a small number of mothers. But because it is based not on expensive technology but on empowering mothers to save lives, it is a breakthrough with the potential to reach out and save children's lives in the poor communities of Bogota, and beyond.

higher proportion of today's mothers are educated is another of those 'social breakthroughs' which can now help to put 'technological breakthroughs' into the hands of those who need them. Any attempt to promote the advantages of breastfeeding or to warn of the dangers of bottle-feeding, or to spread the knowledge of oral rehydration therapy, or to organise immunization campaigns at set times and places, or to introduce the use of growth monitoring charts or family spacing methods, now stands considerably more chance of success. For any mother who is literate has both more opportunity to learn about new ideas and more confidence to put them into practice.

### Slowing population growth

These three improvements in the *lives of women*:—

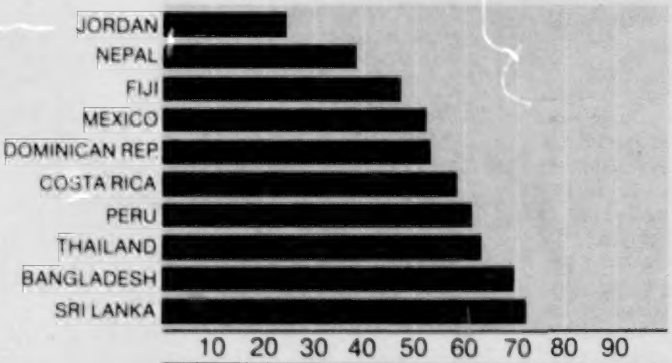
- More food for at-risk women and children during the crucial times of pregnancy, breastfeeding and weaning
- More choice for women over both the size of their families and the interval between births
- More education to increase women's access to vital information

- have also been shown to be amongst the most powerful of all influences on the state of the world's children. And it is not a coincidence that all of these policies were vigorously adopted by the People's Republic of China, the Republic of Sri Lanka, the Republic of Korea, Kerala and Taiwan, whose successes in achieving breakthroughs in health at low levels of economic development were described earlier in this report.

In these five successful cases, subsidised food for the poorest has significantly reduced malnutrition, health and family spacing services have been put at the disposal of every couple, and almost 100% of girls are enrolled in school. The fact that the rate of infant deaths in these areas is approximately 50% less today than the average for the developing world as a whole is testimony to the power of these changes.

But on looking again at these examples, there is one other common characteristic which is important to the idea of a child health revolution. In all of these cases, population growth has slowed and birth-rates have fallen to among the lowest in the developing world.

**Fig. 1.20 Percentage of women with three living children who want no more pregnancies**




Source: Maine D. Family Planning: Its Impact on the Health of Women and Children. The Centre for Population and Family Health, Columbia University, New York, 1981

**Fig. 1.21 Maternal education and infant mortality**

Deaths of children under 2 (per 1000) by education of mother in Latin America

| COUNTRY | None | 1-3 | 4-6 | 7-9 | 10 plus |
|---|---|---|---|---|---|
| | YEARS OF SCHOOLING | | | | |
| PARAGUAY 1972 | 104 | 80 | 61 | 45 | 27 |
| COSTA RICA 1973 | 125 | 98 | 70 | 51 | 33 |
| COLOMBIA 1973 | 126 | 95 | 63 | 42 | 32 |
| CHILE 1970 | 131 | 108 | 92 | 66 | 46 |
| DOMINICAN REP 1975 | 172 | 130 | 106 | 81 | 54 |
| ECUADOR 1974 | 176 | 134 | 101 | 61 | 46 |
| EL SALVADOR 1971 | 158 | 142 | 111 | 58 | 30 |
| BOLIVIA 1975 | 245 | 209 | 176 | 110 | |

Source: S.H. Preston, Mortality Morbidity and Development. Paper presented at the seminar on Population and Development in the ECWA Region. 20 September 1978.

At first sight, it would seem paradoxical that the rate of population growth should fall when the rate of child survival has been drastically improved. But the explanation of that paradox should allay the fears of those who believe that a child health revolution would lead to another population explosion. For in practice, reducing rates of infant mortality is likely to help stabilise world population growth at a lower level and at an earlier time.

Child survival tends to reduce birth rates in three separate ways. First, child survival usually means that the mother continues breastfeeding. As is now well established, breastfeeding is a natural contraceptive, releasing prolactin in the mother's body and delaying the return of ovulation. In the case of Kerala, for example, the death of a child during the first month of life reduces the average interval between births from three years to less than two years. A child dying even in the second year of life reduces the average birth interval by almost six months. Similarly, studies in the Gambia have shown that if a baby dies in the first month of life then the average time before the next birth is only 16 months; if a Gambian child survives for the first two years, on the other hand, then the average gap between one birth and the next increases to about three years. In Bangladesh, the average interval between one birth and the next is also increased by more than a year if the first child survives its infancy.

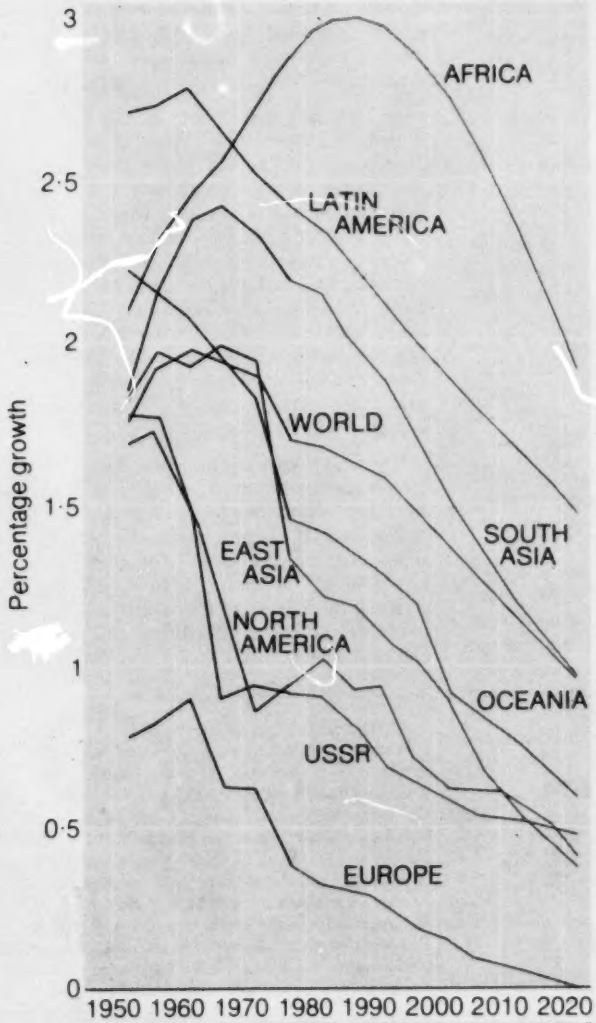
Secondly, improved child survival means that the parents can more confidently give birth to only the number of children they actually want – rather than having extra children to compensate for the fact that one or two or more of their children might die. This link between surviving children and family planning was one of the patterns which came under particular scrutiny during the Narangwal study. Its conclusion was that the fewer the children who died, the greater the likelihood that the mother would use an effective method of family planning – even among women with the same number of surviving children.

That is why this year's *State of World Population* report from the UN Fund for Population Activities concludes that '*birth-rates can be expected to remain high in countries where infant mortality rates are high*'. Meeting under the auspices of the US National Academy of Sciences, a committee of distinguished demographers has come to the similar conclusion that '*policies and programmes aimed at reducing infant and child mortality considerably below present levels may be an essential under-pinning of government programmes for*

*fertility control ... as death rates are brought below 10–15 per thousand in present high-fertility, high-mortality countries, birth rates should be correspondingly reduced'.*

A third mechanism by which an increase in survival can lead to a decrease in births is both more profound and perhaps more powerful. Whether or not a husband and wife will decide to plan the number and spacing of their children is closely related to their own sense of control over their own lives and circumstances. Malnutrition, illiteracy, ill-health and oppression, can leave people with so little sense of control over their own lives and circumstances that they are alienated from the very idea of 'planning'. To expect adults who cannot control or plan any other major aspect of their lives to suddenly start planning just their families is to misunderstand what powerlessness means. If, on the other hand, progress in health and education, in political participation and economic activity, has helped to create a greater sense of mastery over one's own destiny – a sense that decisions can be taken, circumstances changed, and lives improved – then the idea of family spacing is likely to be welcomed as another opportunity to take more control over one's own life.

**Fig. 1.22 Annual rates of population growth, by region, 1950–2025**




*Source: Demographic Indicators of Countries: Estimates and Projections as assessed in 1980. United Nations, New York, 1982.*

# It can be done

It has sometimes been argued that direct attempts to reduce child deaths and improve child health are doomed to failure in the absence of overall social and economic development. But recent experience suggests that such direct campaigns can bring about significant improvements in the lives of children even in poor communities.

Ten such projects (covering populations of 60,000–70,000) were recently examined in a study for the Overseas Development Council.* The projects were chosen not for their apparent success or failure but for the completeness of their before-and-after records. Some of the results:

- Four years after a major project was started in Imesi, Nigeria, infant mortality was down to 50 per 1,000 in the project area as opposed to 91 per 1,000 in nearby villages.
- In northern Peru, a health and nutrition campaign brought the infant death rate down to 48 per 1,000 as opposed to 134 per 1,000 in nearby areas.
- In Jamkhed, India, infant mortality in the small sample population surveyed had fallen from 97 to 39 per 1,000 over the five years of the project's operation.
- In Hanover, Jamaica, the infant mortality rate fell by 25 points between 1970 and 1975 as opposed to only a 3-point decline in Jamaica as a whole.
- In Narangwal, India, child deaths from diarrhoeal and respiratory infections (the two most common causes) were cut by 50% in 17 months.
- In a rural area of Guatemala, a five-year effort reduced infant mortality rates from 150 to 55 per 1,000.

In seven of the cases studied, the per capita cost of the project was similar to, and in some cases lower than, the per capita health spending of the nation in which the project was set.

A study of the common elements in these successes does not yield any hard and fast rules other than the need for competent and dedicated staff and management. But in all cases, improved nutrition for young children and pregnant women played a big role in lowering the rate of infant and child deaths. In Narangwal, for example, each 10% decrease in a young child's weight-for-age brought with it a much greater increase in the probability of death. Growth charts, pioneered with great success at Imesi and refined at Narangwal and Hanover, helped reduce child deaths and improve child health by making possible the early identification of children at risk.

Finally, the authors noted a less obvious common factor: *'A principal characteristic that seemed to distinguish the more successful from the less obviously successful projects,'* they concluded, *'was the degree to which they departed from the Western tradition of hospital-based, high-technology medical services in the search for approaches more appropriate to village conditions.'*

*Davidson R. Gwatkin, Janet R. Wilcox and Joe D. Wray, *Can health and nutrition interventions make a difference?*, Monograph No. 13, Overseas Development Council, February 1980.

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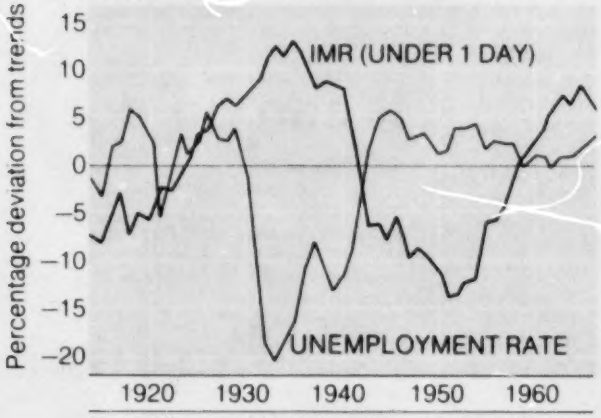
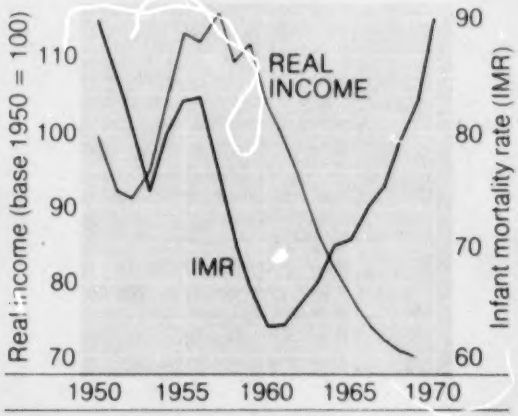
**Fig. 1.23 Economic trends and IMR (first 24 hours), United States, 1915–1965** IMR = Infant deaths per 1000 live births




Source: H. Brenner, Fetal, Infant & Maternal Mortality During Periods of Economic Instability, Int. J. Health Services 3 145-159, 1973.

**Fig. 1.24 Income and infant mortality, Sao Paolo, 1950–1970**




From this point of view, better health and growing confidence in child survival, especially if brought about in part by one's own decisions and actions, becomes a part of that change in mentality.

All of the strategies discussed in this report promote that sense of participation – that sense of being able to affect and improve one's own and one's children's lives. Therefore quite apart from the direct effect which campaigns to promote breastfeeding, birth-spacing, and female education might have on birth-rates, the bringing about of a child survival revolution by the strategies discussed in this report would in itself be likely to lower birth-rates.*

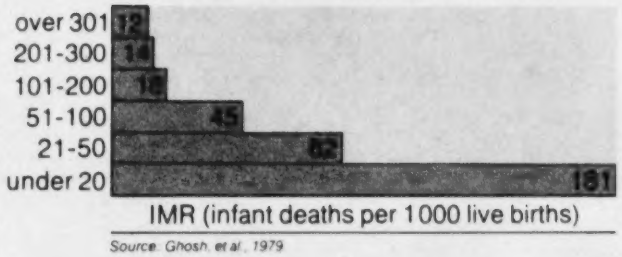
All of these mechanisms linking falling death rates to falling birth rates take time to work themselves through. In the recent past, it was this time-lag between falling mortality and falling fertility which resulted in the 'population explosion'. So even though a child survival revolution would lead – eventually – to falling birth rates, wouldn't population growth again increase sharply during the 1990s? The answer is almost certainly 'no – not this time'.

The reason is that the length of time it takes for birth rates to fall in response to a fall in death rates seems to depend on the degree of progress in reducing death rates which a nation has already made. In the post-war period, a definite pattern seems to have emerged. If a nation's death rate is very high – say, 25 per 1,000 – then reductions in that death rate tend to take quite a long time to produce the corresponding reduction in the birth rate. If, on the other hand, a nation's death rate has already been reduced to as low a figure as 15 per 1,000 – then beyond that point further reductions in the death rate have usually been associated with a much more rapid and steep fall in birth rates. Almost all the countries which had lowered their overall death rates to 15 per 1,000 by the early 1960s, for example, have subsequently seen their birth rates fall by a multiple of every further and subsequent one-point fall in the death rate.

In Thailand, for example, a fall in the death rate from 15 to 8 per 1,000 between 1960–1981 was accompanied by a 14-point fall in the birth rate. Similarly in the Philippines, a fall in death rates from 15 to 7 over that same period was accompanied by a 13-point fall in the birth rate. Colombia, Turkey, Malaysia, the two Koreas, Lebanon, Mexico, Costa Rica, the Dominican Republic – all had death rates of between 10 and 16 per 1,000 in 1960. All of them have since reduced those death rates by a further 5 to 9 points, and in all the birth rate has declined by between 9 and 19 points. And if, as in all of these cases, the birth rate is declining faster than the death rate then, by definition, population growth is slowing down.

The importance of this trend is that the overall death rate in the lower-income developing countries (excluding China where death rates have already been reduced to less than 10) is now approaching that critical death-rate figure of 15 per 1,000. In other words, many nations are now at the point beyond which each further advance in lowering the death rate should, on the evidence of demographic history, lead to a much greater fall in the birth rate.

**Fig. 1.25 Income and infant mortality, New Delhi, 1969–1974**




Source: Ghosh, et al., 1979.

*If increased child survival did not have any effect in lowering birth rates, then it would obviously lead to an increase in population. But as fertility rates are already declining quite steeply in most parts of the developing world, the new 'survivors' would not add as much to future population growth as would have been the case in the past (see Figure 1.22). Even if the infant mortality rate in the developing world were to fall overnight to European or American levels, for example, and even if this did not lead to any reduction in the birth-rate, the overall impact would be that world population would be stabilised at approximately 9.3 billion as opposed to 8.5 billion some time towards the end of the next century. *Because declining infant mortality is known to influence people towards smaller families, a halving of infant death rates would almost certainly result in a further slow-down in the rate of population growth and a lower final total.*

In sum, a revolution in child survival is likely to result in a slowing down of the rate of population growth and to contribute to the stabilisation of world population at an earlier date and at a lower total. As some measure of how significant that contribution could be, India would today have approximately 4.4 million fewer deaths each year and 7.5 million fewer births each year – resulting in a much lower rate of population growth – if the entire nation had the same low death rates and low birth rates as the state of Kerala.

# Inner Development

The combination of breakthroughs in knowledge, techniques and social organisation which are coming together at this time could and should make it possible to bring about a revolution which can save the lives of 20,000 children every day, prevent an equal number of disabilities, and promote the healthy growth and development of many millions more. Furthermore, the confidence and sense of greater control over their own lives which families and communities can gain through simple, affordable, and visibly effective strategies, can both help to slow down population growth and help to build community acceptance of, and enthusiasm for, the wider ideal and infrastructure of primary health care itself.

The knowledge and techniques by which this can be achieved ought now to be communicated world-wide in order to put them at the disposal of every nation, every community, and every family. For the surest guarantee of permanent and self-sustaining improvement in the life of any community is the organised and active participation of that community itself.

It can, of course, be said that the strategies which can bring about these drastic improvements in child well-being do not tackle the fundamental causes of poverty and ill-health. In considerable measure, this is true.

It is true, for example, that in the developing world as a whole the poorest 40% of the people share only about 10% to 12% of their nation's income and that income is also one of the most important determinants of child health and well-being (see Figures 1.23, 1.24, 1.25). In New Delhi, for example, the infant mortality rate in the mid-1970s was found to be 180 per 1,000 among the children of those who earn less than 20 rupees per month as opposed to only 12 per 1,000 (lower than the average for the United States) among the children of families earning more than 300 rupees a month. Similarly, the infant mortality rate among the rich of a city like Port-au-Prince, Haiti, is the same as in the United States – whereas one child in every five dies in the slums of that same city.

It is also true that in many nations the poorest 40% of people in the rural areas may own only 1% or 2% of rural land and that landholding – which of course affects food and income – is also an important influence on a child's chances of health and survival. In Guatemala or Bangladesh, for example, infant mortality rates have been found to rise steeply as the size of family landholding falls (see Figure 1.26). And in many parts of the world, half of the young children are malnourished whilst half of the land is used to grow cash crops for export to those who can afford them rather than food crops for consumption by those who need them.

## Ethiopia: a city decides

In response to the present potential for a child health revolution, the City of Addis Ababa, Ethiopia, has decided to cut child deaths by half within the next four years.

With a population of 1.5 million, Addis Ababa is already one of the largest cities in Africa, and at its current growth rate the population is due to double within ten years. Though shanty towns have not mushroomed around Addis as they have done in so many other African cities, many parts of it are unplanned and overcrowded, with poor housing and little sanitation. There is no question that its children need health care: barely one in three children are vaccinated, and large numbers suffer from diarrhoeal diseases, tuberculosis, respiratory infections and malnutrition. Nearly 40% of all the deaths in the city are attributable to parasitic or gastro-intestinal diseases, and young children, as always, are the hardest hit.

The city is divided into 284 autonomous divisions, or city-dwellers' associations (*kebele*), which are due to play a key role in the accelerated health care programme: in each *kebele* one paid health worker and one unpaid will be trained to provide health services and to co-ordinate the effort as a whole.

The main thrust, however, will come from the *kebele* families themselves; and the effort to educate and motivate them will draw on every available source – city council and *kebele* health committees, government ministries and university departments, the National Children's Commission, the Ethiopian Women's Institute, the Revolutionary Ethiopian Women's Association, and the Revolutionary Ethiopian Youth Association.

Specific goals have been set. The initial aim is to halve the infant mortality rate, from 150 to 75 per 1,000, within four years: all mothers and children under two are to be fully immunised; all mothers will be educated about oral rehydration and how to use it (plans are already afoot for the local manufacture of salts); and mothers will be trained to monitor the growth of all children under three, receiving nutritional advice and supplementary foods when these are needed.

In the second phase of the programme, directed at bringing infant mortality down to 50 per 1,000 by 1990, these measures will be complemented by regular food supplements for pregnant women and children and pre-natal and post-natal care for all who need it. And, most importantly, by work to make the *kebele* health system entirely self-sustaining.

Addis Ababa stands on the threshold of its own child health revolution. The plans are in place, and the political commitment is there. The next four years will tell if the hope becomes a reality.

**Fig. 1.26 Occupation of household head and child death rate, Matlab, Bangladesh, 1974–1977**

Greater justice, both within and between nations, is therefore of fundamental relevance to the well-being of children. Within nations, even moderate measures to help the incomes of the poorest 20% grow just a little more quickly would greatly reduce the incidence of malnutrition by the end of the century. Between nations, one-quarter of the annual *increase* in the industrialized world's wealth could double the *total* annual budgets for both health and education combined in all the developing nations.

The industrialised nations, containing a quarter of the world's people, still control more than three quarters of the world's wealth. By and large, that gives them the power to lay down the rules of world trade, regulate the workings of the international monetary system, decide what investments will be made and where, determine the course of scientific and technological research, and organise the international division of labour largely in their own interests. As a result, the majority of developing countries have correspondingly little control over the price they receive for the raw materials they have to sell, or the price they pay for the manufactured goods they have to buy, or the value of the currency they must use, or the world monetary system within which they must earn their living, or the terms of the investments they seek, or the amounts and conditions of the aid they receive.

All of these are fundamental problems having a direct effect on national revenues, on governmental services, on employment opportunities, on family incomes, and therefore on children's well-being. Their solution depends on the long struggle for economic growth, economic justice and social development.

Progress in solving these problems is tragically slow. And for at least the next few years, the fact must be faced that there is little likelihood of any vast increase in the scale of resources available for development. In that context, the emergence of low-cost opportunities to re-gear the ratio between resources and results and accelerate progress for the world's neediest children cannot be ignored.

Exactly ten years ago, those children were made a promise by the international community. At the closing ceremony of the World Food Conference in 1974, the objective was proclaimed 'that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition'.

Tonight, more children will go to bed hungry, their capacities stunted, than on the night those words were spoken.

How much longer are we going to ask them to wait? Definite actions with definite results, actions capable of large-scale impact at relatively low financial and political cost, are available *now*. And they are actions in which almost everybody can be involved.

Nor should it be assumed that these actions are not addressed to some of the fundamental problems of world poverty. Inasmuch as they can put into people's hands and minds the means to bring about improvements in their own lives through their own efforts and their own organisations, they can help to build a sense of self-respect and self-determination and create an ethos which contributes to further progress and greater justice.

And inasmuch as they can play a part in one of the most fundamental tasks of all – the protection of that process of 'inner development' in the growing minds and bodies of young children – they can help to break into the cycle by which poverty and injustice have so long been perpetuated. That is why the child health revolution touches the roots of the development problem. And that is why it offers new hope for today's children – and tomorrow's world.

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# **Recession:**
# The impact on children

During 1983, a special study *The Impact of World Recession on Children* has been prepared by UNICEF staff and field offices assisted by an international panel of distinguished economists. The study, including ten country case studies,* appears in full in the hard-cover edition of *The State of The World's Children 1984* – available through Oxford University Press and from UNICEF Offices. The following is a brief synopsis of its evidence and argument.

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The world economy is now in its deepest and most sustained recession since the Great Depression of the 1930s. Yet in all the recent writings on recession, not a single study has looked at its impact on the most vulnerable half of the world's people – the children.

The main problem facing any such study is the lack of even elementary statistical information about changes in child well-being. For most countries, rich or poor, it is easier to find out how many dishwashers have been sold than it is to find out how many children have been immunized. What is needed, in all countries, is a *child monitoring system* to provide an early warning of any deterioration in the well-being of the rising generation.

Despite this deficiency, fragmentary evidence of the recession's impact on children is beginning to surface in different parts of the world. In Zambia, information from the poorer northern regions is indicating a fall in children's height-for-age. In São Paulo, the proportion of low-birth-weight babies is rising. In Costa Rica, the number of children being treated for severe malnutrition has doubled between 1981 and 1982. In the USSR, infant death rates have risen sharply. And in the United States, infant mortality rates have also risen in areas such as Alabama and Michigan, which have been particularly hard hit by recession.

As these examples suggest, it is usually the poorest members of society who are most exposed.

In all countries, the poor spend a greater proportion of their incomes on necessities such as food or fuel or basic medical care. Any decline in that income therefore threatens not just material progress but the ability to maintain health and life. In such circumstances, the risk is greatest to the growing minds and bodies of young children.

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* The countries selected are Tanzania, Sri Lanka, India, Zambia, Nigeria, Brazil, The Republic of Korea, Chile, Costa Rica, and Cuba.

***Multipliers***

This economic vulnerability is paralleled by the political vulnerability of the poor. Many of the mechanisms which link the international economic system to the poor neighbourhoods of the developing world are mechanisms which act like reverse shock absorbers – increasing the impact of recession as they pass that impact down the line. It has been estimated, for example, that a 1% fall in the rate of growth of the industralised countries tends to produce a 1.5% fall in the average rate of growth of the developing countries. Within the developing nations themselves, an echo of that same process passes the economic shock-wave on to the poorest sections of their own societies. A 2% to 3% decline in the average income of a developing nation, for example, can easily result in a 10% to 15% decline in the income of the poorest classes. Finally, this same process may happen again within the poor communities themselves: in many societies, females and young children depend on what is left – of the evening meal and of the weekly wage – after their husbands and older sons and brothers have met their needs.

By such mechanisms is the greatest burden of the world economic recession passed on to those who are least able to sustain it. Ironically, the main protection for the very poor has been the fact that so many of them live in rural areas which are only peripherally linked to the world economy. Although many of the rural poor have escaped the full impact of the recession, drought and poor harvests have had a serious effect, particularly in the last two years.

***Falling Incomes***

Family income is perhaps the main medium for the transmission of recession's impact to the children of the poor. And in many parts of the world, average real family incomes have fallen, often sharply and over several years, as a result of the recession and world-wide inflation. In the Latin American region, for example, average incomes have now been in decline for two consecutive years. Income per person in Brazil fell by over 4% in 1981 and by almost another 2% in 1982. In Chile, per capita GNP fell by 15% in 1981 alone and in Costa Rica real incomes have fallen by as much as one-third. These averages often disguise even steeper declines among the poor and unemployed.

Africa, the continent with the least to fall back on, has undoubtedly been hardest hit in recent years. Real per capita income in more than half the countries of Africa is less today then ten years ago.

*(continued over)*

**Recession:** The impact on children

With recession in many countries compounding the effects of drought, wars, and the long-term set-backs of inflation and oil price increases, overall per capita GNP in Africa south-of-the-Sahara fell by an estimated 2% between 1979 and 1980 and is expected to show another 2% decline for 1982.

Hardest hit of all are the nations dependent on raw material exports to the industralised world. In 1982, for example, the world price of copper fell to its lowest level for 50 years: in copper-dependent Zambia, government capital expenditure has been cut by two-thirds and average incomes have been almost halved in recent years. Least affected of all the regions of the developing world is Asia, where many nations are protected from the worst effects of recession either by their relative self-sufficiency (as with China and India) or by their past economic progress.

Although recession's impact differs from nation to nation, most of the countries for which data are available are showing an increase in the number of children who are living below national poverty lines and a widespread and unambiguous deterioration in the quality of children's lives.

***Welfare cut-backs***

Alongside falling family incomes, cut-backs in government services for children are the other main medium by which economic recession is transmitted to the lives of the young. Because social welfare programmes, and particularly those for children, are usually not protected by powerful interest groups, and because they are often erroneously regarded as 'uneconomic', they generally suffer quickly and disproportionately from any forced cut-backs in government expenditure in both industrialised and developing countries. Under the impact of recession the *share* of government expenditure devoted to basic needs programmes has declined in many nations.

Overall, the economic recession has contributed to a decline in both the quality and quantity of services for children – from maternal and child health clinics and immunization programmes to supplementary feeding and primary schools.

***Policies***

Fortunately, economic set-back and child well-being are not linked in a fixed ratio. Several nations have achieved levels of health and education for their children which are measurably higher than other nations where average incomes may be twice as high. The impact of world recession on children is ultimately more a matter of political policy than of economic inevitability. Within the developing countries, policies to protect children from recession should begin with the recognition that investments in the health and education of the young should be the last, not the first, to be cut back. Economic adjustment policies should be consciously designed to restructure in ways which protect children, the poor, and the vulnerable – not ignore them or sacrifice them in the name of economic efficiency. Whether judged by hard-headed economic calculation or by the elementary tenets of human welfare, protection of the physical and mental capacities of a nation's people and a nation's future is the most fundamental of all investments. The maintenance of basic services, minimum standards of nutrition, health, education and household income, is therefore the first and most important line of defence for a nation's children. In practice, that defence will usually require a more equitable distribution of income.

Internationally, protecting and improving the lives of children could be helped by ending recession and reviving economic activity through the lowering of interest rates, import duties, and trade restrictions by the industrialised nations. At the same time, the immediate policy of the main international financial institutions needs to be reviewed to stop the main burden of recession from falling on the poorest people and to protect high-priority social and health services. And although such appeals continue to echo emptily down the corridors of power, higher levels of development assistance, equivalent to only a very small percentage of the world's current expenditure on armaments, could and would improve the lives of the world's children.

***The Response***

The evidence we have of a deterioration in the lives of children should be taken as a clear warning. For, almost certainly, the worst is yet to come. The impact of recession takes time to work through the channels which lead to children. And our knowledge of that impact, in the absence of any systematic and sensitive child monitoring service, also lags behind the event.

Our response to this warning must be both humane and 'realistic'. The recession is a fact of life. And it means that there will almost certainly be no large-scale increase in the level of resources available for improving child well-being in the poorest half of the world during the 1980s.

What we are now faced with is therefore a challenge to policy. All countries should review their national and international policies to assess their impact on children, the poor, and the vulnerable – and to see how that impact can be ameliorated. The fact of recession means that progress for children now will have to depend more than anything else on improving the ratio between resources available and results achievable. It is in this overall context that the 1984 *State of the World's Children* report is presented. For the high-impact, low-cost strategies which it draws together are examples of what can be done to streamline the effort to improve the lives of children so that progress may be maintained and accelerated even against the headwind of world recession.



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# Basic Statistics

## Index to Nations

In the following table (pages 40–41), the countries are listed in descending order of infant mortality. Countries with the same rates are listed alphabetically. The reference numbers indicating that order are shown in the alphabetical list of countries below.

| | | | | | |
|---|---|---|---|---|---|
| Afghanistan | 2 | Guyana | 83 | Oman | 29 |
| Albania | 80 | Haiti | 39 | Pakistan | 34 |
| Algeria | 37 | Honduras | 57 | Panama | 96 |
| Angola | 8 | Hong Kong | 122 | Papua New Guinea | 51 |
| Argentina | 82 | Hungary | 101 | Paraguay | 81 |
| Australia | 119 | India | 32 | Peru | 59 |
| Austria | 110 | Indonesia | 47 | Philippines | 77 |
| Bangladesh | 24 | Iran | 48 | Poland | 102 |
| Belgium | 111 | Iraq | 65 | Portugal | 99 |
| Benin | 9 | Ireland | 116 | Romania | 97 |
| Bhutan | 10 | Israel | 107 | Rwanda | 21 |
| Bolivia | 25 | Italy | 109 | Saudi Arabia | 42 |
| Botswana | 61 | Ivory Coast | 33 | Senegal | 22 |
| Brazil | 62 | Jamaica | 108 | Sierra Leone | 3 |
| Bulgaria | 103 | Japan | 129 | Singapore | 117 |
| Burma | 45 | Jordan | 70 | Somalia | 18 |
| Burundi | 30 | Kampuchea | 4 | South Africa | 60 |
| Cameroon | 38 | Kenya | 66 | Spain | 123 |
| Canada | 120 | Korea, Dem. Rep. of | 90 | Sri Lanka | 84 |
| Central African Rep. | 11 | Korea, Rep. of | 91 | Sudan | 35 |
| Chad | 12 | Kuwait | 92 | Sweden | 130 |
| Chile | 85 | Lao People's Dem. Rep. | 27 | Switzerland | 127 |
| China | 67 | Lebanon | 86 | Syria | 74 |
| Colombia | 73 | Lesotho | 40 | Tanzania | 52 |
| Congo | 26 | Liberia | 15 | Thailand | 78 |
| Costa Rica | 98 | Libya | 49 | Togo | 43 |
| Cuba | 104 | Madagascar | 71 | Trinidad and Tobago | 93 |
| Czechoslovakia | 106 | Malawi | 6 | Tunisia | 53 |
| Denmark | 124 | Malaysia | 95 | Turkey | 36 |
| Dominican Rep. | 68 | Mali | 16 | Uganda | 54 |
| Ecuador | 63 | Mauritania | 19 | USSR | 100 |
| Egypt | 31 | Mauritius | 89 | United Arab Emirates | 79 |
| El Salvador | 64 | Mexico | 75 | United Kingdom | 118 |
| Ethiopia | 13 | Mongolia | 76 | United States | 115 |
| Finland | 128 | Morocco | 50 | Upper Volta | 1 |
| France | 121 | Mozambique | 41 | Uruguay | 88 |
| German Dem. Rep. | 112 | Nepal | 17 | Venezuela | 87 |
| Germany, Fed. Rep. of | 113 | Netherlands | 125 | Viet Nam | 55 |
| Ghana | 46 | New Zealand | 114 | Yemen Arab Rep. | 5 |
| Greece | 105 | Nicaragua | 58 | Yemen, People's Dem. Rep. | 23 |
| Guatemala | 69 | Niger | 20 | Yugoslavia | 94 |
| Guinea | 7 | Nigeria | 28 | Zaire | 44 |
| Guinea-Bissau | 14 | Norway | 126 | Zambia | 56 |
| | | | | Zimbabwe | 72 |

# Basic Statistics:

| | | Infant mortality rate (aged 0-1 year) 1981 | 1960 | GNP per capita (US $) 1981 | Total population (millions) 1981 | Crude birth rate/ crude death rate 1981 | Life expectancy at birth (years) 1981 | % 1 year-olds immunised against measles 1980 | % Infants born with low birth-weight 1979 | Adult literacy rate 1970 M/F | 1980 M/F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Very high infant mortality countries (IMR over 100)** | | **140** | **180** | **320** | **1,301.9T** | **46/19** | **47** | **17** | **16** | **28/9** | **42/19** |
| 1 | Upper Volta | 210 | 250 | 240 | 6.3 | 48/22 | 44 | 23 | 21 | 13/3 | 18/5 |
| 2 | Afghanistan | 200 | 230 | 170[a] | 16.4 | 47/26 | 37 | 6 | | 13/2 | 26/6 |
| 3 | Sierra Leone | 200 | 230 | 320 | 3.6 | 46/18 | 47 | 23 | | 18/8 | 31/17 |
| 4 | Kampuchea | 190 | 150 | 70[c] | 6.8 | 41/23 | 39 | .. | | 71/23 | 78/39 |
| 5 | Yemen Arab Rep. | 190 | 210 | 460 | 5.9 | 48/23 | 43 | 4 | | 9/1 | 18/2 |
| 6 | Malawi | 170 | 210 | 200 | 6.1 | 56/23 | 44 | 65 | .. | 42/18 | 48/25 |
| 7 | Guinea | 160 | 210 | 300 | 5.1 | 47/22 | 43 | .. | 18 | 21/7 | 35/14 |
| 8 | Angola | 150 | 210 | 490 | 7.3 | 49/23 | 42 | 17[f] | 19 | 16/7 | 36/19 |
| 9 | Benin | 150 | 210 | 320 | 3.5 | 49/17 | 50 | 6[f] | .. | 23/8 | 40/17 |
| 10 | Bhutan | 150 | 200 | 80 | 1.3 | 40/19 | 45 | 18 | .. | ../.. | ../.. |
| 11 | Cent. African Rep. | 150 | 200 | 320 | 2.3 | 43/22 | 43 | .. | 23 | 26/6 | 48/19 |
| 12 | Chad | 150 | 200 | 110 | 4.5 | 43/22 | 43 | .. | 11 | 20/2 | 35/8 |
| 13 | Ethiopia | 150 | 180 | 140 | 32.2 | 48/24 | 46 | 7 | 13 | 9/4 | 11[d]/5[d] |
| 14 | Guinea-Bissau | 150 | 190 | 190 | 0.8 | 41/22 | 37 | .. | 9 | 13/6 | 25/13 |
| 15 | Liberia | 150 | 190 | 520 | 2.0 | 50/14 | 54 | 100 | .. | 27/8 | 42/18 |
| 16 | Mali | 150 | 200 | 190 | 7.2 | 49/21 | 45 | .. | 13 | 11/4 | 19/8 |
| 17 | Nepal | 150 | 200 | 150 | 15.0 | 44/20 | 45 | 2 | .. | 23/3 | 34/6 |
| 18 | Somalia | 150 | 180 | 280 | 4.9 | 48/25 | 39 | 3 | .. | 5/1 | 11/3 |
| 19 | Mauritania | 140 | 190 | 460 | 1.7 | 44/20 | 44 | 45 | .. | ../.. | 17[e] |
| 20 | Niger | 140 | 190 | 330 | 5.5 | 51/21 | 45 | 19 | .. | 6/2 | 14/6 |
| 21 | Rwanda | 140 | 150 | 250 | 5.1 | 54/20 | 46 | 42 | 17 | 43/21 | 61/39 |
| 22 | Senegal | 140 | 180 | 430 | 5.8 | 48/21 | 44 | .. | 10 | 18/5 | 31/14 |
| 23 | Yemen PDR | 140 | 210 | 460 | 2.0 | 48/20 | 46 | 6 | .. | 31/9 | 48/16 |
| 24 | Bangladesh | 130 | 160 | 140 | 90.6 | 47/18 | 48 | 2 | 50 | 36/12 | 43/20 |
| 25 | Bolivia | 130 | 170 | 600 | 5.8 | 42/16 | 51 | 14[h] | .. | 68/46 | 79/58 |
| 26 | Congo | 130 | 170 | 1,110 | 1.6 | 43/10 | 60 | 49 | 13 | 50/19 | 70/44 |
| 27 | Lao PDR | 130 | 160 | 80 | 3.8 | 43/21 | 43 | .. | 18 | 37/28 | 51/36 |
| 28 | Nigeria | 130 | 180 | 870 | 79.7 | 50/17 | 49 | 55 | 18 | 35/14 | 46/23 |
| 29 | Oman | 130 | 190 | 5,920 | 0.9 | 48/17 | 49 | 7 | .. | ../.. | ../.. |
| 30 | Burundi | 120 | 150 | 230 | 4.3 | 46/20 | 45 | 30 | 14 | 29/10 | 39/15 |
| 31 | Egypt | 120 | 130 | 650 | 43.5 | 36/12 | 57 | 59 | 14 | 50/20 | 56/28 |
| 32 | India | 120 | 170 | 260 | 676.2 | 35/13 | 52 | (.) | 30 | 47/20 | 55/29 |
| 33 | Ivory Coast | 120 | 170 | 1,200 | 8.3 | 46/18 | 47 | .. | 14 | 26/10 | 45/24 |
| 34 | Pakistan | 120 | 160 | 350 | 84.6 | 46/16 | 50 | 3 | 27 | 30/11 | 39/18 |
| 35 | Sudan | 120 | 170 | 380 | 18.9 | 47/18 | 47 | 1 | 17 | 28/6 | 38/14 |
| 36 | Turkey | 120 | 190 | 1,540 | 45.4 | 33/9 | 62 | 52 | .. | 69/35 | 80/50 |
| 37 | Algeria | 110 | 170 | 2,140 | 19.6 | 45/13 | 56 | 17 | 10 | 39/11 | 60/24 |
| 38 | Cameroon | 110 | 160 | 880 | 8.7 | 43/17 | 50 | 16 | 11 | 47/19 | 62/36 |
| 39 | Haiti | 110 | 180 | 300 | 5.1 | 33/13 | 54 | .. | .. | 26/17 | 34/24 |
| 40 | Lesotho | 110 | 140 | 540 | 1.4 | 42/15 | 52 | 49 | 15 | 49/74 | 58/81 |
| 41 | Mozambique | 110 | 160 | 230 | 10.8 | 44/17 | 49 | .. | .. | 29/14 | 44/23 |
| 42 | Saudi Arabia | 110 | 190 | 12,600 | 9.3 | 45/13 | 55 | 10 | .. | 15/2 | 35/12 |
| 43 | Togo | 110 | 180 | 380 | 2.7 | 49/18 | 48 | .. | .. | 30/8 | 46/20 |
| 44 | Zaire | 110 | 150 | 210 | 29.4 | 46/16 | 50 | 20 | 16 | 61/22 | 74/37 |
| **High infant mortality countries (IMR 60 to 100)** | | **90** | **140** | **865** | **1,284.9T** | **44/11** | **58** | **34** | **13** | **58/37** | **68/55** |
| 45 | Burma | 100 | 160 | 190 | 36.2 | 37/13 | 54 | 0 | 20 | ../.. | 66[e] |
| 46 | Ghana | 100 | 140 | 400 | 12.1 | 49/13 | 54 | .. | .. | 45/20 | 59/37 |
| 47 | Indonesia | 100 | 150 | 530 | 150.5 | 35/13 | 54 | (.) | 18 | 66/42 | 77/58 |
| 48 | Iran | 100 | 160 | 2,160[b] | 39.0 | 43/11 | 58 | 44 | 14 | 40/17 | 55/30 |
| 49 | Libya | 100 | 160 | 8,450 | 3.1 | 47/12 | 57 | 62 | .. | 60/13 | 76/36 |
| 50 | Morocco | 100 | 160 | 860 | 20.6 | 46/13 | 57 | .. | .. | 33/11 | 41/18 |
| 51 | Papua N. Guinea | 100 | 170 | 840 | 3.1 | 36/15 | 51 | .. | 25 | 32/19 | 48/30 |
| 52 | Tanzania | 100 | 150 | 280 | 18.5 | 47/15 | 52 | 82 | 13 | 48/18 | 53[e]/33[e] |
| 53 | Tunisia | 100 | 110 | 1,420 | 6.5 | 34/9 | 61 | 65 | 7 | 44/17 | 61/34 |
| 54 | Uganda | 100 | 140 | 220 | 13.6 | 50/18 | 48 | 22 | 10 | 52/30 | 65/41 |
| 55 | Viet Nam | 100 | 160 | 100[k] | 55.0 | 35/8 | 63 | .. | .. | ../.. | 87[e] |
| 56 | Zambia | 100 | 150 | 600 | 6.0 | 49/16 | 51 | 72[f] | 14 | 66/37 | 79/58 |
| 57 | Honduras | 90 | 150 | 600 | 3.8 | 44/11 | 59 | 35[h] | .. | 55/50 | 64/62 |
| 58 | Nicaragua | 90 | 140 | 860 | 2.8 | 44/11 | 57 | 15 | .. | 58/56 | 61[e]/60[e] |
| 59 | Peru | 90 | 160 | 1,170 | 18.3 | 36/11 | 58 | 23[h] | 9 | 81/60 | 89/73 |
| 60 | South Africa | 90 | 140 | 2,770 | 30.1 | 39/9 | 63 | .. | 15 | 70/71 | 81/81 |
| 61 | Botswana | 80 | 120 | 1,010 | 0.9 | 50/13 | 57 | 63 | .. | 41/43 | 61/61 |
| 62 | Brazil | 80 | 120 | 2,220 | 121.5 | 30/8 | 64 | 72[h] | 9 | 69/63 | 76/73 |
| 63 | Ecuador | 80 | 140 | 1,180 | 8.6 | 40/9 | 62 | 22[h] | .. | 75/68 | 82/76 |
| 64 | El Salvador | 80 | 140 | 650 | 4.9 | 40/8 | 63 | 58 | 13 | 61/53 | 70/63 |
| 65 | Iraq | 80 | 140 | 3,020[g] | 13.5 | 47/12 | 57 | 33 | 6 | 50/18 | 68/32 |
| 66 | Kenya | 80 | 140 | 420 | 17.3 | 55/13 | 56 | .. | 18 | 44/19 | 60/35 |
| 67 | China | 70 | 170 | 300 | 1,007.8 | 21/8 | 67 | .. | 6 | ../.. | 69[e] |
| 68 | Dominican Rep. | 70 | 120 | 1,260 | 5.6 | 36/8 | 62 | 17[h] | 15 | 69/66 | 75/73 |
| 69 | Guatemala | 70 | 90 | 1,140 | 7.5 | 39/10 | 59 | 45[f] | 18 | 51/37 | 59/44 |

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| | Infant mortality rate (aged 0–1 year) 1981 | 1960 | GNP per capita (US $) 1981 | Total population (millions) 1981 | Crude birth rate/ crude death rate 1981 | Life expectancy at birth (years) 1981 | % 1 year-olds immunised against measles 1980 | % Infants born with low birth-weight 1979 | Adult literacy rate 1970 M/F | 1980 M/F |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 Jordan | 70 | 140 | 1,620 | 3.4 | 46/9 | 62 | 11 | 7 | 64/29 | 78/53 |
| 71 Madagascar | 70 | 110 | 330 | 9.0 | 47/18 | 48 | | 10 | 56/43 | 68/55 |
| 72 Zimbabwe | 70 | 120 | 870 | 7.6 | 54/13 | 55 | 56 | 15 | 63/47 | 77/61 |
| 73 Colombia | 60 | 100 | 1,380 | 28.8 | 29/8 | 63 | 26 | 10 | 79/76 | 86/84 |
| 74 Syrian Arab Rep. | 60 | 130 | 1,570 | 9.3 | 47/8 | 65 | 17 | | 59/21 | 72/35 |
| **Middle infant mortality countries (IMR 26 to 50)** | **40** | **80** | **1,875** | **653.8T** | **30/7** | **69** | **52** | **11** | **86/75** | **91/85** |
| 75 Mexico | 50 | 90 | 2,250 | 71.2 | 36/7 | 66 | 12[f] | 12 | 78/69 | 86/80 |
| 76 Mongolia | 50 | 110 | 780[a] | 1.7 | 34/7 | 64 | 96 | | 87/74 | 93/86 |
| 77 Philippines | 50 | 110 | 790 | 49.5 | 34/7 | 63 | 22[f] | 20 | 83/80 | 90/88 |
| 78 Thailand | 50 | 100 | 770 | 47.5 | 30/8 | 63 | 0 | 13 | 86/72 | 93/83 |
| 79 U. Arab Emirates | 50 | 140 | 24,660 | 0.8 | 30/7 | 63 | 34 | | 24/7 | 30/19 |
| 80 Albania | 46 | 80 | 840[a] | 2.8 | 29/6 | 70 | 90 | | ../.. | ../.. |
| 81 Paraguay | 46 | 90 | 1,630 | 3.3 | 32/7 | 65 | 25 | | 84/75 | 90/83 |
| 82 Argentina | 44 | 60 | 2,560 | 28.1 | 20/9 | 71 | 65 | 6 | 94/92 | 95/94 |
| 83 Guyana | 43 | 70 | 720 | 0.9 | 29/6 | 70 | | | 94/88 | 96/93 |
| 84 Sri Lanka | 43 | 70 | 300 | 15.0 | 27/6 | 69 | 0 | 21 | 85/69 | 87/76 |
| 85 Chile | 42 | 110 | 2,560 | 11.3 | 25/7 | 68 | 89 | 13 | 90/86 | 94/91 |
| 86 Lebanon | 40 | 70 | 1,070[a] | 2.7 | 30/8 | 66 | | 12 | 74/52 | 83/64 |
| 87 Venezuela | 40 | 90 | 4,220 | 14.3 | 35/6 | 68 | | 11 | 79/71 | 84/78 |
| 88 Uruguay | 39 | 50 | 2,820 | 2.9 | 20/10 | 71 | 55[f] | 10 | 93/93 | 95/95 |
| 89 Mauritius | 34 | 70 | 1,270 | 1.0 | 26/6 | 65 | 33[f] | | 77/59 | 86/72 |
| 90 Korea, Dem. Rep. | 33 | 80 | 1,130[a] | 18.3 | 31/6 | 66 | | | ../.. | ../.. |
| 91 Korea, Rep. of | 33 | 80 | 1,700 | 38.7 | 24/7 | 66 | 5[f] | 8 | 92/78 | 96/88 |
| 92 Kuwait | 33 | 90 | 20,900 | 1.5 | 38/4 | 70 | 66 | | 65/42 | 72/54 |
| 93 Trinidad & Tobago | 31 | 50 | 5,670 | 1.2 | 29/8 | 72 | | | 95/89 | 97/94 |
| 94 Yugoslavia | 31 | 90 | 2,790 | 22.5 | 17/9 | 71 | 95[b] | 7 | 89/74 | 93/81 |
| 95 Malaysia | 30 | 70 | 1,840 | 14.4 | 31/7 | 65 | | 9 | 71/48 | 79/61 |
| 96 Panama | 29 | 70 | 1,910 | 1.9 | 30/5 | 71 | 52 | 11 | 81/81 | 87/86 |
| 97 Romania | 29 | 80 | 2,540 | 22.4 | 18/10 | 71 | | | 96/91 | 97/94 |
| 98 Costa Rica | 27 | 80 | 1,430 | 2.3 | 30/4 | 73 | 52 | 9 | 88/87 | 92/92 |
| 99 Portugal | 26 | 80 | 2,520 | 9.9 | 16/10 | 72 | 70[f] | | 76/66 | 85/76 |
| 100 USSR | 26 | 33 | 4,550[c] | 267.7 | 19/10 | 72 | 95[b] | 8 | 98/97 | 99/98 |
| **Low infant mortality countries (IMR 25 and less)** | **12** | **31** | **8,405** | **840.4T** | **14/9** | **74** | **70** | **6** | **94/89** | **96/93** |
| 101 Hungary | 21 | 48 | 2,100 | 10.7 | 13/14 | 71 | 99[b] | 12 | 98/98 | 99/98 |
| 102 Poland | 21 | 60 | 3,900[c] | 35.9 | 19/9 | 73 | 65 | 8 | 98/97 | 99/98 |
| 103 Bulgaria | 20 | 45 | 4,150[c] | 8.9 | 14/11 | 73 | 98 | | 94/89 | 96/93 |
| 104 Cuba | 19 | 70 | 1,410[a] | 9.7 | 18/6 | 73 | 56 | 10 | 86/87 | 91/91 |
| 105 Greece | 18 | 40 | 4,420 | 9.7 | 15/9 | 74 | | | 90/76 | 94/83 |
| 106 Czechoslovakia | 17 | 24 | 5,820[c] | 15.3 | 16/12 | 72 | 95[b] | 6 | ../.. | ../.. |
| 107 Israel | 16 | 31 | 5,160 | 3.9 | 25/7 | 73 | 69 | 6 | 92/85 | 96/91 |
| 108 Jamaica | 16 | 50 | 1,180 | 2.2 | 29/6 | 71 | | 10 | 84/89 | 90/93 |
| 109 Italy | 14 | 44 | 6,960 | 57.2 | 11/10 | 74 | | 11 | 95/93 | 96/95 |
| 110 Austria | 13 | 38 | 10,210 | 7.5 | 13/12 | 73 | 90[b] | 6 | ../.. | 99[e] |
| 111 Belgium | 12 | 31 | 11,920 | 9.9 | 13/11 | 73 | 50 | | 99/99 | 99/99 |
| 112 German Dem. Rep. | 12 | 39 | 7,180[c] | 16.7 | 14/14 | 73 | 95 | 6 | ../.. | ../.. |
| 113 Germany, Fed. Rep. | 12 | 34 | 13,450 | 61.7 | 10/12 | 73 | 35[b] | 7 | ../.. | 99[e] |
| 114 New Zealand | 12 | 23 | 7,700 | 3.1 | 16/8 | 74 | 80[b] | 5 | ../.. | 99[e] |
| 115 USA | 12 | 26 | 12,820 | 229.8 | 16/9 | 75 | 96[b] | 7 | 99/99 | 99/99 |
| 116 Ireland | 11 | 23 | 5,230 | 3.4 | 21/9 | 73 | | | ../.. | 98[c] |
| 117 Singapore | 11 | 36 | 5,240 | 2.4 | 18/5 | 72 | 58[b] | 11 | 82/55 | 88/70 |
| 118 United Kingdom | 11 | 23 | 9,110 | 55.8 | 13/12 | 74 | 50[b] | 7 | ../.. | 99[e] |
| 119 Australia | 10 | 20 | 11,080 | 14.9 | 16/7 | 74 | | 6 | ../.. | 100[e] |
| 120 Canada | 10 | 27 | 11,400 | 24.3 | 16/7 | 75 | | 6 | ../.. | 99[e] |
| 121 France | 10 | 27 | 12,190 | 54.0 | 15/10 | 76 | | 7 | 99/98 | 99/99 |
| 122 Hong Kong | 10 | 37 | 5,100 | 5.2 | 19/5 | 75 | | 8 | 90/64 | 94/77 |
| 123 Spain | 10 | 50 | 5,640 | 37.7 | 14/8 | 74 | | | 93/87 | 96/91 |
| 124 Denmark | 9 | 22 | 13,120 | 5.1 | 10/11 | 75 | | 6 | ../.. | 99[e] |
| 125 Netherlands | 8 | 18 | 11,790 | 14.2 | 13/8 | 76 | 91[b] | 4 | ../.. | 99[e] |
| 126 Norway | 8 | 19 | 14,060 | 4.1 | 13/10 | 76 | | 4 | ../.. | 99[e] |
| 127 Switzerland | 8 | 21 | 17,430 | 6.4 | 12/9 | 76 | | | ../.. | 99[e] |
| 128 Finland | 7 | 21 | 10,680 | 4.8 | 13/9 | 75 | 70[b] | 4 | ../.. | 100[e] |
| 129 Japan | 7 | 30 | 10,080 | 117.6 | 13/6 | 77 | 69[b] | 5 | 99/99 | 99/99 |
| 130 Sweden | 7 | 17 | 14,870 | 8.3 | 11/11 | 77 | 56[b] | 4 | ../.. | 99[e] |

KEY
a) 1979
b) 1977
c) 1974
d) 1975
e) Total literary rate
f) UNICEF field office estimate
g) 1980

Unless otherwise stated, the summary measures for the four groups of countries are the median values for each group. The median is the middle value of a data set arranged in order of magnitude.

T = Total for group
.. = Data not available
( ) = Less than half unit shown

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*MAIN SOURCES*
U.N. Statistical Office
U.N. Population Division
The World Bank
UNESCO
WHO
FAO

Further information about UNICEF and its work may be obtained from:

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Ivory Coast

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BG—Sofia

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